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ELEMENTS

OF

PHARMACY, MATERIA MEDICA,

AND

THERAPEUTICS.

WM. STRAIN AND SONS,
PRINTERS,
GREAT VICTORIA STREET, BELFAST
AND
7, QUEEN VICTORIA STREET, LONDON, E.C.

ELEMENTS

OF

PHARMACY,

MATERIA MEDICA,

AND

THERAPEUTICS.

BY

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PROFESSOR OF MATERIA MEDICA AND THERAPEUTICS IN QUEEN'S COLLEGE, BELFAST;
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ETC., ETC., ETC.

With Woodcuts.

SEVENTH EDITION.

LONDON: HENRY RENSHAW, 356, STRAND.

1898.

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☞ For Treatment in cases of
POISONING,
See Index at end of the Book.
Page 618.

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In Memoriam.

MATTHEW CHARTERIS, M.D.,

PROFESSOR OF MATERIA MEDICA

IN THE UNIVERSITY OF GLASGOW, 1880 TO 1897,

THIS VOLUME IS

Affectionately and respectfully Dedicated

BY HIS FRIEND,

THE AUTHOR.

PREFACE TO THE FIRST EDITION.

THE aim of this little work is to give to the student of medicine such information in a concise form as he generally has to sift out of two or more of the larger manuals. So many valuable volumes have been written on Materia Medica and Therapeutics as to leave little necessity for another ; but it is not the intention of the writer to presume that this work will take the place of any of them, the question of space necessitating the knowledge being given to the reader often in a very fragmentary condition.

The arrangement of the subject, which has been sanctioned by custom, has been departed from, the work being divided into distinct and separate sections, and the drugs arranged alphabetically. The writer found that most students, in grappling with Materia Medica, generally read the Therapeutics of each remedy once or twice over, while its preparations had to be committed to memory. Thus, a process of confused selection always distracted, and prevented that clear view of each detail so necessary to ensure a thorough grasp of every branch of the subject. Many students, too, have already mastered the chemistry of each drug in the laboratory, and hence to such, an arrangement like the one adopted will probably be beneficial ; whilst to those who have not, the condensed bird's-eye view of the subject may be appreciated. The writer is satisfied that this plan is open to serious objection, as is the most generally followed one, but he hopes that it may assist the already overtaxed student, who often fails to get any idea of the subject at all if the matter be not placed in a condensed form within his reach.

Actuated by the feeling that Pharmacy is one of the most important sections of Materia Medica, he has laboured to put this

generally neglected branch in as attractive a light as possible, and has called to his aid the few original woodcuts in the first part of the work.

This brief outline of Pharmacy is in no way intended to replace that *practical* knowledge of the art which the writer believes should be an essential accomplishment of every educated physician, and which he hopes to soon see rendered compulsory by examining bodies.

The condensation required in every page to keep the work in a small compass prevented that full recognition of the labours of many in the advancement of Materia Medica, which the writer would have desired.

He is grateful for the kind assistance of Mr. J. O'Neill, M.A., in the preparation of the Grammatical Aids to Prescription Writing.

BELFAST, *December, 1881.*

PREFACE TO THE SEVENTH EDITION.

THE last edition of this work has been out of print for some time, as it was considered undesirable to issue a new edition till after the appearance of the British Pharmacopœia, 1898.

The Author has incorporated with the present text all the new Official drugs and preparations, and has omitted those which the revisers have excluded from the new B.P. These changes have necessitated the re-writing of a considerable portion of the volume, which the Author hopes is brought thoroughly up to date.

The 188 omissions from the Pharmacopœia, and a re-arrangement of type, have afforded space for the introduction of much entirely new matter without adding to the size of the book. The section of Non-Official Remedies will be found to contain short notices of about 300 new drugs not mentioned in the previous editions, while about 70 which appeared in the last issue have been omitted. It will thus be seen that this portion of the volume may be regarded as a new work, and the Author has made an attempt to give a brief enumeration of all the new drugs which promise to be of any value in practical medicine.

He is much indebted to Doctor Victor Fielden, who has again carefully revised the proof-sheets, and has contributed the articles on Pill Coating and Cachet Making, and who has prepared the elaborate index at the end of the volume.

8, COLLEGE SQUARE N., BELFAST,
June 1st, 1898.

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Benzol. (In Appendix, 1885)
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Caffeinæ Citras Effervescens
Caoutchouc
Carbonis Bisulphidum
Cocaina
Codeinæ Phosphas
Extractum Belladonnæ Liquidum
Extractum Ipecacuanhæ Liquidum
Extractum Jaborandi Liquidum
Extractum Nucis Vomicæ Liquidum
Extractum Strophanthi
Glycerinum Acidi Borici
Glycerinum Pepsini
Hydrargyri Oleas
Hyoscinæ Hydrobromidum
Hyoscyaminæ Sulphas
Infusum Scoparii
Kaolinum
Lamellæ Homatropinæ
Liquor Calumbæ Concentratus
Liquor Caoutchouc
Liquor Chiratæ Concentratus
Liquor Cuspariæ Concentratus
Liquor Ethyl Nitritis
Liquor Hamamelidis
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Liquor Rhei Concentratus
Liquor Sarsæ Compositus Concentratus
Liquor Senegæ Concentratus
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Liquor Serpentariæ Concentratus
Liquor Thyroidei
Lithii Citras Effervescens
Morphinæ Tartras
Naphthol
Oleum Pini
Oleum Rosæ
Paraffinum Liquidum
Physostigminæ Sulphas
Pilula Quininæ Sulphatis
Pix Carbonis Præparata
Pruni Virginianæ Cortex
Quillaiæ Cortex
Quininæ Hydrochloridum Acidum
Salol
Spiritus Anisi
Strychninæ Hydrochloridum
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Suppositoria Belladonnæ
Syrupus Aromaticus
Syrupus Calcii Lactophosphatis
Syrupus Cascaræ Aromaticus
Syrupus Codeinæ
Syrupus Ferri Phosphatis cum Quinina et Strychnina
Syrupus Glucosi
Syrupus Pruni Virginianæ
Terebenum
Thyroideum Siccum
Tinctura Ergotæ Ammoniata
Tinctura Pruni Virginianæ
Tinctura Quillaiæ
Trochiscus Acidi Carbolici
Trochiscus Eucalypti Gummi
Trochiscus Guaiaci Resinæ
Trochiscus Krameriæ

Trochiscus Krameriæ et Cocainæ
Unguentum Aquæ Rosæ
Unguentum Capsici
Unguentum Cocainæ
Unguentum Hydrargyri Oleatis
Unguentum Hydrargyri Oxidi Flavi
Unguentum Paraffini

OMISSIONS FROM THE B.P., 1898.

Acetum
Acidum Lacticum Dilutum
Acidum Meconicum
Aconiti Folia
Alcohol Amylicum
Ammonii Nitras
Anisi Stellati Fructus
Aqua
Argentum Purificatum
Aurantii Fructus
Beberinæ Sulphas
Belæ Fructus
Bismuthi Citras
Bismuthi et Ammonii Citras
Bismuthum
Bismuthum Purificatum
Calamina Præparata
Canellæ Cortex
Carbo Animalis
Carbo Animalis Purificatus
Cataplasma Carbonis
Cataplasma Conii
Cataplasma Fermenti
Cataplasma Lini
Cataplasma Sinapis
Cataplasma Sodæ Chlorinatæ
Cerevisiæ Fermentum
Cetraria
Charta Epispastica
Cinchonæ Cortex (Cinchonæ Rubræ Cortex is retained)
Cinchonidinæ Sulphas
Cinchoninæ Sulphas
Confectio Opii
Confectio Rosæ Caninæ
Confectio Scammonii
Confectio Terebinthinæ
Creta
Cupri Nitras
Decoctum Cetrariæ
Decoctum Cinchonæ
Decoctum Hordei
Decoctum Papaveris
Decoctum Pareiræ
Decoctum Quercûs
Decoctum Sarsæ
Decoctum Sarsæ Compositum
Decoctum Scoparii
Decoctum Taraxaci
Ecballii Fructus
Elemi
Emplastrum Ferri
Emplastrum Galbani
Emplastrum Saponis Fuscum
Enema Aloes
Enema Asafœtidæ
Enema Magnesii Sulphatis
Enema Opii
Enema Terebinthinæ
Essentia Anisi
Essentia Menthæ Piperitæ
Extractum Aconiti
Extractum Aloes Socotrinæ
Extractum Belæ Liquidum
Extractum Calumbæ
Extractum Colchici Aceticum
Extractum Conii
Extractum Gelsemii Alcoholicum
Extractum Hæmatoxyli

Extractum Jaborandi
Extractum Lactucæ
Extractum Lupuli
Extractum Mezerei Æthereum
Extractum Papaveris
Extractum Pareiræ
Extractum Quassiæ
Extractum Rhamni Frangulæ
Extractum Rhamni Frangulæ Liquidum
Farina Tritici
Ferri Peroxidum Hydratum
Ferri Sulphas Granulata
Glycerinum Acidi Gallici
Gutta Percha
Hordeum Decorticatum
Hydrargyri Persulphas
Infusum Anthemidis
Infusum Catechu
Infusum Cusso
Infusum Jaborandi
Infusum Lini
Infusum Maticæ
Infusum Valerianæ
Kamala
Lac
Lactuca
Laricis Cortex
Liquor Ammonii Acetatis Fortior
Liquor Ammonii Citratis Fortior
Liquor Antimonii Chloridi
Liquor Calcii Chloridi
Liquor Ferri Acetatis Fortior
Liquor Ferri Dialysatus
Liquor Gutta Percha
Liquor Iodi
Liquor Lithiæ Effervescens
Liquor Magnesii Citratis
Liquor Morphinæ Bimeconatis
Liquor Morphinæ Sulphatis
Liquor Potassæ Effervescens
Liquor Sodæ
Liquor Sodæ Effervescens
Manna
Marmor Album
Mastiche
Maticæ Folia
Mel
Mica Panis
Mistura Ferri Aromatica
Mistura Scammonii
Mori Succus
Morphinæ Sulphas
Mucilago Amyli
Nectandræ Cortex
Oleatum Hydrargyri
Oleatum Zinci
Oleo-resina Cubebæ
Oleum Myristicæ Expressum
Oleum Pini Sylvestris
Oleum Rutæ
Oleum Sabinæ
Os Ustum
Ovi Albumen
Ovi Vitellus
Physostigmina
Pilula Conii Composita
Pilula Ferri Carbonatis
Pilula Ferri Iodidi
Plumbi Nitras
Potassii Cyanidum
Potassii Ferrocyanidum
Quercûs Cortex
Rhamni Frangulæ Cortex
Rosæ Caninæ Fructus
Rosæ Centifoliæ Petala
Sabadilla
Sabinæ Cacumina
Santonica
Sodii Nitras
Sodii Valerianas
Spiritus Tenuior
Suppositoria Acidi Carbolici cum Sapone
Suppositoria Acidi Tannici cum Sapone
Suppositoria Hydrargyri
Suppositoria Morphinæ cum Sapone.
Syrupus Ferri Subchloridi
Syrupus Mori
Syrupus Papaveris

Tabaci Folia
Theriaca
Tinctura Aurantii (Cort. Sicc.)
Tinctura Chloroformi Composita
Tinctura Ergotæ
Tinctura Ferri Acetatis
Tinctura Gallæ
Tinctura Laricis
Tinctura Lobeliæ
Tinctura Sabinæ
Tinctura Valerianæ
Tinctura Veratri Viridis
Tinctura Zingiberis Fortior
Trochisci Opii
Unguentum Antimonii Tartarati
Unguentum Calaminæ
Unguentum Elemi
Unguentum Potassæ Sulphuratæ
Unguentum Sabinæ
Unguentum Simplex
Unguentum Terebinthinæ
Uvæ
Vapor Acidi Hydrocyanici
Vapor Chlori
Vapor Coninæ
Vapor Creosoti
Vapor Iodi
Vapor Olei Pini Sylvestris
Veratri Viridis Rhizoma
Vinum Aloes
Vinum Opii
Vinum Rhei

INTRODUCTION.

THE term MATERIA MEDICA implies a description of the agents used in the treatment of disease, their preparation, actions, and uses; but owing to the rapid advance made in our knowledge of remedies, special terms are now used to designate the different departments in this extensive subject; and we confine the words

Materia Medica to the description of remedies, their origin, source, distribution, chemical composition, and the methods by which they are obtained, &c.,

Pharmacy to the methods by which they are prepared for administration,

Pharmacology to the science of their action on a healthy organism, and

Therapeutics to their application in the treatment of disease.

The term Materia Medica, even so restricted in its application, embraces Botany, Zoology, and Chemistry, and, indeed, is built up of these sciences.

The term **Pharmacodynamics** is occasionally used, even by modern writers, when referring to Pharmacology; and the old term **Pharmacognosy** is sometimes retained in text-books as a synonym of Materia Medica. Both these terms can be advantageously dispensed with.

We may divide the science and art of Pharmacy into two distinct divisions:

Extemporaneous Pharmacy, and
Official Pharmacy.

The first head will include the various operations of compounding and dispensing remedies from the prescriptions of the physician, and under Official Pharmacy will be briefly defined the different processes mentioned in the British Pharmacopœia in the directions given for the preparation of its numerous drugs and formulæ.

Under the head of Materia Medica, in addition to the brief description of the physical characters, sources, chemical properties, doses, preparations, &c., of the various drugs in the "Pharmacopœia," will be grouped together the Official Preparations themselves, mostly in tabular form, so that the student can have a bird's-eye view of their composition and doses.

The Pharmacology of each drug will be given under its name in the section of this work devoted to Therapeutics, where its *physiological* action will be briefly discussed in connection with its *therapeutic* indications and uses.

Under the head of Administration of Medicines will be treated the science of writing and reading prescriptions, and a short glossary of terms and abbreviations used by physicians in ordering remedies. Under this division of the subject the classification of remedial agents and the important questions of dosage or posology and of incompatibility will be dealt with.

The Materia Medica, Pharmacy, Pharmacology, and Therapeutics of the most important drugs not yet included in the British Pharmacopœia will be detailed in the section dealing with Non-Official Remedies near the end of the volume.

PART I.

PHARMACY.

CHAPTER I.

EXTEMPORANEOUS PHARMACY, OR THE COMPOUNDING AND DISPENSING OF PRESCRIPTIONS.

THE student is often confused by the frequent use of the words "compounding" and "dispensing." The former may be said to apply to the mixing, blending, or preparing of the drugs ordered in a prescription, while the latter refers to the way in which they are put up, labelled, and sent out to the patient: thus the incorporation of a mixture of several substances is spoken of as its *compounding*, after which it is to be *dispensed* in a flat, square, or round bottle; but if a prescription, for example, should contain an order for twelve five-grain Dover's powders, it would be simply a case of dispensing, since the medicine is always kept compounded by the dispenser.

It has been said that "no one should be allowed to *write* a prescription unless he is able to *compound* it," and if such were the rule of examining boards, doubtless more useful and more elegant prescriptions would be the fashion, and even if it were not so, the training requisite to make a good dispenser would be a great accomplishment to the practical physician, teaching him habits of neatness, readiness, and accuracy, and giving him a practical acquaintance with drugs obtainable in no other way.

The compounding of medicines can only be really learned at the dispensing counter; but a few general directions will be here given as a guide to the student. It is an essentially practical study; once the prescription is in the hand of the dispenser he must give to it his undivided and concentrated attention. Day-dreaming must be for the moment laid aside, and in proportion to the thoroughness with which he isolates himself from everything but the sheet of paper before him, so will his success be. The prescription should first be read carefully through, and any inconsistency of dose noticed. Difficulties in reading and deciphering will nearly always disappear on a careful comparison of the formation of the letters in the doubtful word with those in

the unmistakeable portions of the prescription. If an evidently poisonous, or even an unusually large dose is ordered, or if substances absolutely incompatible are prescribed, it will be well to consult the prescriber before proceeding further, but this will not be a likely or common occurrence. In compounding almost every prescription, there are several processes continually being employed which deserve a few passing remarks.

Weighing, the essential element of which is accuracy, is generally only required in dealing with small quantities, as rarely more than one ounce of any solid is ordered in a prescription; more commonly it is only with grains that the dispenser is directed to work, and in dealing with quantities from a few grains to as many drachms, the ordinary fixed upright beam and scales, which are found on every dispensing counter, answer all purposes.

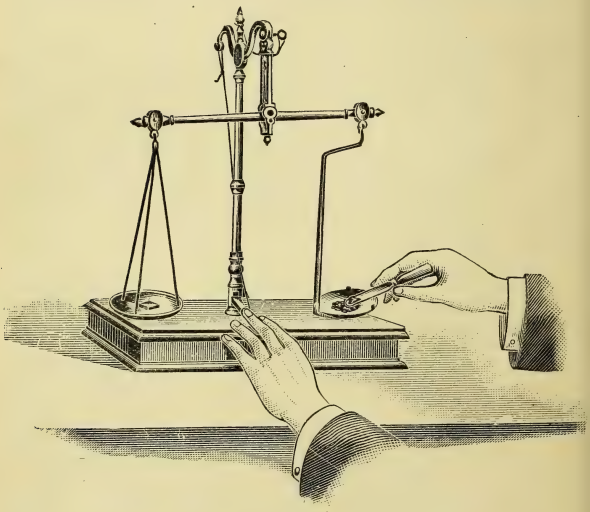


Fig. 1.

They are generally provided with one movable glass pan, which should be opposite the operator's right hand, and on to which the substance to be weighed is to be gradually placed, the weights having been previously put on the opposite scale. The pan, or scale, should invariably be wiped with a dry cloth each

time after use. The omission of this is one of the minute points which stamps a slovenly compounder, and, as a rule, he who will not take the trouble to leave his scales and weights tidy after him will not take the trouble to weigh accurately the medicines prescribed.

For minute quantities of powerful drugs, like morphine, strychnine, and most active substances under two grains in weight, the scales that are being constantly used to weigh as much as two or three drachms should not be employed. For this purpose more delicate scales, or a chemical balance, should be used, and the substance gradually added, particle after particle, from a small spatula, till the scale comes to the level of the opposite, and remains there, as indicated by the pointer. In this manner the $\frac{1}{100}$ of a grain can be easily appreciated.

It is very often necessary to weigh small quantities of soft extracts for pills. This should only be done in this way:—Two little pieces of smooth wrapping paper should be made of the same size, which is accurately done by cutting a piece out of two sheets, one placed in contact with the other. When two pieces of precisely the same size and weight are thus obtained, one should be placed on the left-hand scale along with the weights; the other is to receive upon it the soft substance, and to be placed on the opposite scale, and when the requisite weight of material is added, it can easily be detached from the paper with a knife. The same plan should be used with corrosive substances, like iodine, if the scale-pan is not of glass.

The Pharmacopœia recognises no weight between a grain and an ounce, the ounce being equal to 437½ grains, and the pound being equal to 16 ounces, or 7,000 grains.

It will be seen that in this weight, which is called the Imperial Standard or Avoirdupois weight, there is no drachm or scruple, but in the preface to the Pharmacopœia it is written that "it will be optional with the physician *in prescribing* to use the symbols of the drachm (ʒ) and the scruple (℈), the former representing 60 and the latter 20 grains." However, it is now becoming the custom to order solids by grains or ounces, and confine the use of the drachm to the liquid measure of 60 minims, or the eighth part of a *fluid* ounce.

If, therefore, the dispenser meets with a drachm or a scruple of a solid substance in a prescription, he is to put in 60 or 20 grains—though strictly about 54½ grs. and 18 grs. are respectively equivalent to the $\frac{1}{8}$ and $\frac{1}{24}$th of an avoirdupois ounce.

The Metric system which has been introduced into the new Pharmacopœia should be understood by all students and dispensers. All weights and measures in this system are easily calculated, being either multiples or fractions of ten. A prefix is used to indicate each quantity—deka = 10 times, hecto = 100

times, kilo = 1,000 times, deci = $\frac{1}{10}$, centi = $\frac{1}{100}$, and milli = $\frac{1}{1000}$. For example, 1 kilogramme = 1,000 grammes, 1 centigramme = $\frac{1}{100}$ gramme, &c. The foundation upon which all the metric weights and measures are built is the metre, which was considered to be the one ten-millionth part of the distance between the pole and the equator, and is equal to 39·37 inches. The metre is divided into tenths, hundredths, and thousandths, the hundredth being, of course, 1 centimetre. The *cubic* centimetre (commonly written 1 c.c.) is the connecting link between measure and weight, for the *weight* of 1 c.c. of water at 4° C. is termed a gramme (= 15·432 grains). 1,000 c.c. is the basis of measure by volume, and is called 1 litre (= 35 oz. 1 dr. 43 mins.).

In another part of the book will be found tables giving the various weights and measures of this system with their English equivalents.

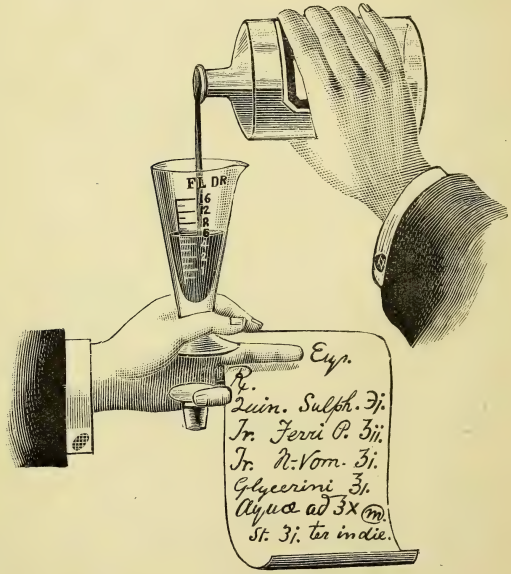


Fig. 2.

The **Measuring** of liquids is a simple process, but, like many others, requires care and practice, and should be done always

according to rule. Graduated glass measures are used of various shapes, which should have the lines marked both in front and at the back. The measure should be held between the thumb and next two fingers of the left hand (Fig. 2), and raised nearly to the level of the dispenser's eye. The bottle to be poured from is grasped firmly by the right hand, the stopper being previously withdrawn and held by the little finger of the opposite hand. The fluid is then poured out, the foot of the measure being held horizontally, the level of the liquid being tested by the lines on its front and back aspects. In looking through a quantity of liquid in a glass, two lines, or a double line, may be noticed, the upper one being caused by the concave surface of the liquid, produced by capillary attraction. The lower line, which is the true level, is the one to be taken into account in measuring. *Never pour out with the label downwards*, otherwise the drop of moisture left on the lip will trickle down and injure it. The label should be *always* on the side of the bottle which is upwards, as in the Figure.

For measuring small quantities of medicine (and it is generally an active medicine that is ordered in small quantity) the measure which is used for ounces should not be employed, as it

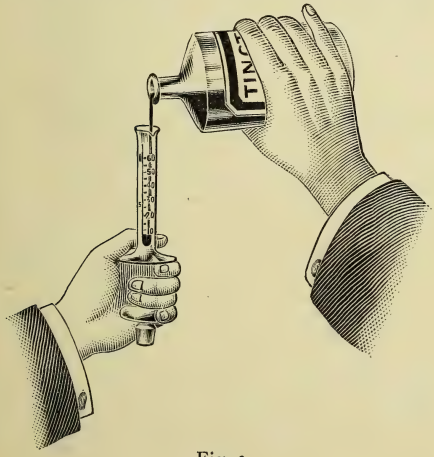


Fig. 3.

will be found impossible to be accurate in pouring a drachm into the bottom of a two-ounce glass. The measure which is

figured should be then used ; it is known as a minim measure, and is of the capacity of either one or two drachms.

It may be held like the larger glass, but the careful and neat dispenser will hold it as in the Figure, which does not interfere with the light passing through even a minute quantity near the bottom. Some hold the larger measure in the same way. In measuring liquids in very narrow glasses like the one figured, the surface of the liquid will be found to be *deeply* concave, owing to capillary attraction being stronger than in wide vessels, and it is sometimes puzzling to get the true level, which should be midway between the highest point close to the glass, and the lowest in the centre. It is not safe to count upon the lowest line as in working with the larger measures, because if we did the fluid which is attracted to the glass would not be included.

Substances like copaiba and castor oil should not be measured —not, however, because of the reason always assigned, that the measure is so difficult to clean, for accuracy should sacrifice every other consideration in compounding, but because of the fact that if one ounce of such a substance is carefully measured about seven-eighths of it only will be got out of the glass. Hence it is advisable either to weigh it, making allowance for its specific gravity, or else to pour it into the bottle in which it is to be dispensed, having previously marked with a strip of paper the extent occupied by an ounce of water in the same bottle. Before returning the stopper into a bottle out of which a liquid has been poured, the drop that hangs from the lip should be caught upon the bottom of the stopper by simply touching it—thus continual moisture is generally prevented from trickling down the side of the bottle ; this little detail should be carefully attended to in the case of acids, corrosive liquids, and syrups.

Dropping.—The bottle should be lightly grasped in the right hand by all the fingers, except the index one, and held in a vertical position with the bottom downwards, till the stopper is lifted partially out by the fingers of the left hand, and held there by the right index finger, which presses it downward as the bottle is sloped to allow the liquid to drop out. Before permitting the drops to fall into any quantity of other medicine, a few should be allowed to drop on the floor till the dispenser is satisfied he has perfect control over the regularity with which the drops issue from the bottle in his hand, otherwise they might come out with a rush, rendering it impossible to count them, in which case the liquid or medicine into which they fall must necessarily be rejected. This may be avoided by the unpractised dispenser allowing the drops to fall into an empty measure, when, if too many flow out, he can reject them without risking the liquid into which they are to go, but if the drops be volatile, this should not be done. Liquids like chloroform, hydrocyanic acid, ether, nitrite

of amyl, &c., should not be dropped, but always measured. A ten or twenty per cent. solution of such substances can be kept in stock, so that there may be no difficulty in accurately measuring the smallest quantities, as when two or three drops of dilute hydrocyanic acid are ordered in a draught.

It is a good rule to let each drop reach its destination before another flows out. If the drops hesitate to flow at the start, the lip of the bottle should be wetted. When the dropping has concluded, the stopper is taken altogether out for an instant to allow the liquid accumulated about the neck to flow back again into the bottle before the stopper is thrust home; various bottles, with patent stoppers, have been devised to facilitate dropping; but, as a rule, every requirement is met by the

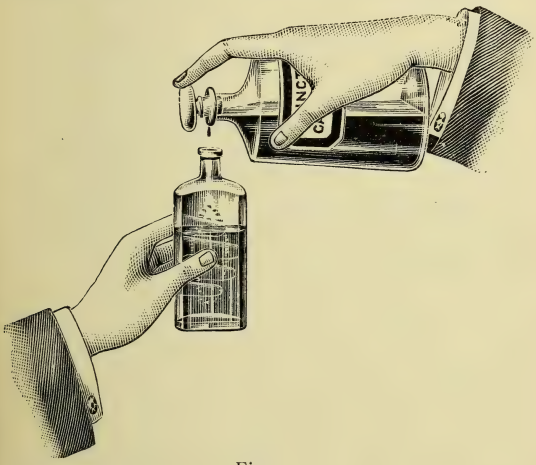


Fig. 4.

above plan. The student should remember that a drop is a vague and indefinite quantity, supposed to be identical with a minim, which it seldom is. Elaborate tables have been prepared, showing how many drops of certain liquid preparations are found to correspond with one drachm: thus it is generally stated that there are 120 drops of tincture of digitalis or laudanum in one fluid drachm, and 45 of Prussic acid in the same

bulk. It is, however, well known that the number and size of the drops depend, not so much upon the nature of the liquid, as upon some accidental circumstances—as the shape and size of the stopper, or especially *the shape of the lip of the bottle*, and the degree of moisture about it, &c. The practice of ordering drops should be entirely given up, and minims directed to be measured instead, unless, perhaps, when two or three drops of a flavouring essence are ordered in a mixture.

Hydrocyanic acid is best measured with a long graduated syringe, and many other liquids could be treated in a similar way with advantage.

CHAPTER II.

MIXING OR MIXTURE-MAKING.

UNDER the term "Mixture" in Pharmacy is included every extemporaneous fluid compound intended for internal use, except a few bearing distinctive names—as draughts or enemata. It would be difficult to give such general directions to the dispenser as would equally apply to the preparation of so many really different compounds—as solutions, emulsions, decoctions, &c.; but a little practical experience will soon show him how he may apply the knowledge gained in making one class of preparations to aid him in compounding another.

Mixtures are ordered and dispensed in 2, 3, 4, 6, 8, 10, and 12 ounce bottles, and occasionally in 16 and 20 ounce; and taking the simplest form of mixture where two or more fluid medicines are ordered together, it will be seen that the compounding of this will only mean the measuring of the different ingredients in a glass and pouring them into a bottle; still, this must be done methodically, and attention to the following is advisable:—Until the dispenser has had considerable experience he should, after reading over the prescription, carry the different medicine bottles required from their different places and set them down beside him before he begins to measure, otherwise he may "lose his head," or get confused in travelling from one part of the surgery to another. This practice, however, should be no excuse for bottles being left upon the dispensing counter. After the mixture is made each should be carefully put back into its proper position; and the same law applies to every operation in Pharmacy, for nothing should be left lying about out of its place: it is in this way mistakes are often made. It will be noticed that in carrying a stock bottle from its shelf,

collecting it with others where the dispenser is to work, and putting it back after he has finished, its label will be certain to be examined at least *three* times. The skilful compounder will make up a mixture more expeditiously by taking the measure-glass in the left hand, as if about to use it as previously described, and the prescription between the middle two fingers of the same hand, and, proceeding with his right hand entirely free, walking to and fro, he can compound his mixture as quickly and accurately as if all were within reach of his hand—as they should be when possible. This is well shown in Figure 2. Care is requisite to prevent the paper being soiled.

As regards the *order* in mixing liquids for a simple mixture it is not of so much importance as in making emulsions, and often the ingredients can be mixed in the order in which they are written. It is a good plan to pour the tinctures or spirituous fluids (as they are measured) into the bottle in which the mixture is to be made, mix them, and then add the syrups or essences, and finally fill up with the water or infusion ordered; in this way a better mixture is often made than if the tinctures were each singly added to a large body of water, when their resinous principles would be sure to be precipitated. Suppose in a prescription of eight ounces of mixture, containing two ounces of tinctures, one ounce of mucilage, and five ounces of water, if the dispenser added the mucilage to the undiluted tinctures, an unsightly mess would be the result; the mucilage should either be added last, or largely diluted with the water, before adding the tinctures; but the difficulty about the *order* of mixing ingredients will be found to be more imaginary than real—a little common sense and experience will soon overcome it. There is, however, one rule which is almost universally neglected, and it is of importance:—If there be a very poisonous substance, like Prussic acid, strychnine, aconite, arsenic, corrosive sublimate, &c., ordered in a mixture, it should be put in the *last thing* before corking, unless there be some reason for the contrary. The force of this is obvious, for, if this be the dispenser's habit or rule, the possibility of his putting it in twice is out of the question; and often when the attention is unavoidably arrested, the ablest will forget what he has just accomplished. All mixtures should be briskly shaken before the label is put on, to ensure thorough incorporation.

Distilled water should be invariably used; no doubt, in many instances, it will be of little moment, but a mixture made at one time with distilled water and at another with fountain water, will taste differently; and, on the whole, it will be found advisable to use it to insure uniformity.

Should a mixture be filtered if not bright and clear? Unless specially ordered it should not, or unless some of the articles

employed in its preparation were not as bright as they should be; it should always be strained through wetted wool or tow plugged lightly into a funnel, if any foreign particles are observed in it; this will almost always be necessary if the mixture has been made in a mortar; and most of the next class of mixtures get dirt incorporated with them, no matter how careful the dispenser is, and there are often foreign particles mixed up with the salt before solution which are not visible till water is added. It will be always necessary to run a little water through the strainer before pouring in the



Fig. 5.

medicine. Suppose, now, the prescription contains a solid substance to be dissolved in the mixture, the dispenser, if the substance is very easily dissolved, may weigh it, drop it into the bottle by means of a little paper bent into a **V**-shape (off which most powders will pour like liquids), add the water or vehicle ordered, and shake briskly till the salt is dissolved; this often does away with the necessity of straining; but if the salt dissolve slowly, or if there be more of it ordered than the

water will dissolve, then it must be rubbed up with *cold* water in a mortar with a pestle—to use which skilfully and neatly requires a good deal of practice and care.

Fig. 5 represents the mortar being used to triturate a hard substance. The pestle is firmly grasped by the right hand, and power is applied from the *shoulder and arm*, *the wrist being kept rigid*, and the elbow nearly stiff. By a series of rotatory movements, chiefly at the shoulder joint, the pestle is made to travel slowly round the sides of the mortar—always being brought in the same direction, that is *towards* the operator's body, not from it—each rotation becoming shorter and quicker until the centre of the mortar is reached, when a few large sweeps bring it out to the sides again, and the same movements are repeated as before—the object being to crush each particle between the sides of the mortar and the pestle. The mortar should be steadied by the left hand, and as the material gathers towards the handle of the pestle, it is to be scraped off with a spatula—which should occasionally be swept round the inside of the mortar. In this manner hard gritty substances are reduced to a fine powder.

If more of a salt is ordered than the water will dissolve, it should be in this way well rubbed up with successive portions of cold water, and dispensed as a fine powder lying at the bottom of the mixture, and not, as is often done, presented to the patient in large crystals which he doubts whether to swallow or reject. Warm water would probably dissolve the salt and give a clear mixture, but on cooling, large crystals would form on the bottom and sides of the bottle.

Another class of mixtures is often ordered where a vegetable powder, as rhubarb or ginger, or a substance like precipitated sulphur or bismuth, is directed to be compounded with water generally thickened with a little syrup or mucilage, in which cases the most careless would hardly think of pouring the powder into the bottle and filling up with water, as it would thus reach the patient in little hard lumps or pellets. The powder should be weighed and put into a porcelain or wedgewood mortar, with as much water as will make a thin paste, and after rubbing it smooth, more water is gradually added till a uniform mixture is obtained. The trituration here is of a different nature to that required in powdering substances or grinding them, as in the last Figure. In this instance the powder is already fine, and only its intimate admixture with water is required—hence the mortar is used in a different way, as Fig. 6 shows. A swift graceful movement is communicated to the pestle by the *wrist*, the handle being lightly grasped as a pen is held, and no motion should be allowed at the elbow or shoulder ; as in the last instance the pestle is made to sweep

round the sides of the mortar always in the direction inwards or towards the dispenser, never "off" him. If syrup or mucilage is ordered to help the suspension of such powder in a mixture, it is advisable to rub the powder up with it first before adding water, and shaking all thoroughly before labelling.

When calcined magnesia is ordered in a mixture, an exception to the above rule of rubbing in a mortar may be made ; thus, suppose an 8 oz. mixture, with two ounces of syrups or tinctures, two drachms of magnesia, and six ounces of water, be prescribed, here the dispenser may measure the water first in a large

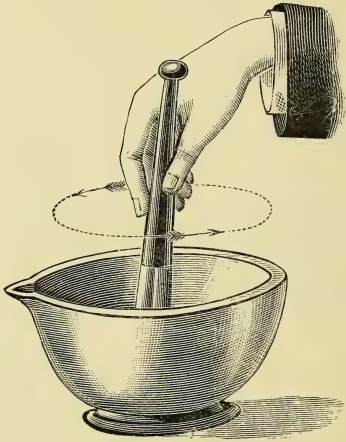


Fig. 6.

measure, weigh the magnesia and drop it on to the surface of the water, when it will gradually sink to the bottom as a perfectly smooth and uniform sediment. During its sinking he measures out the fluid ingredients, pours them into the bottle in which they are to be dispensed, by which time the magnesia and water are ready for pouring in on the top of them. This completes the mixture, which is whiter and more uniform than if rubbed up in a mortar, however clean.

Often a good deal of trouble is experienced with the froth that rises, especially upon vegetable solutions after agitation, preventing the bottle being filled or corked. A few drops of spirit cause this to rapidly disappear ; and it is a good plan, if there be

any spirituous liquid in the prescription, to keep a little of this to the last for this purpose. All mixtures with any deposit should have a label directing the bottle to be shaken before pouring out; and in all cases where the dispenser is in doubt about a mixture depositing a sediment, he should err on the safe side, and put on a "shake the bottle" label before sending it to the patient. It is a custom to direct all mixtures containing Prussic acid to be shaken before use. This has arisen from a mistaken notion that the acid floats upon the top when the mixture is allowed to rest. Such is not the case, but the very volatile ingredients in a half-filled bottle of mixture may rise in vapour and condense upon the inside of the empty part of the bottle, and on a dose being poured out it would contain a relatively larger proportion of the volatile substance, hence even in these cases a "shake the bottle" label should be put on, one thing being certain—that it can do no harm if unnecessary.

The next class of mixtures includes emulsions. They require more care and skill in their preparation and prescribing than most other extemporaneous compounds. An emulsion is a watery mixture resembling milk in appearance, containing an oil or resin in suspension, and not capable of easy or ready separation. The suspension of the oil or resin is effected through the agency of several substances, as gum, soap, alkali, or yolk of egg.

Several substances when rubbed up with water in a mortar make perfect emulsions; the gum-resins, ammoniacum, myrrh, and asafetida behave in this way. The milky mixtures thus prepared are called *natural* emulsions, and the explanation of the phenomenon is simple—each substance contains, in addition to its resin, as much gum as will suspend it when water is added. If the pharmacist wishes, then, to make an emulsion with a resin, he imitates this natural preparation by adding gum acacia or tragacanth, such as the official mixture of guaiacum, in which the resin is ordered to be triturated with a little sugar and gum, adding gradually the cinnamon water. The mucilage for emulsions should be always recently made, and not *acid*. The mucilage made from Pulv. Acaciæ is generally acid, and consequently that made with lump gum is much superior. To make this, however, impromptu is not generally possible, but if made in large quantity it can be kept for some time in a perfectly fresh condition by completely filling a number of 3 oz. bottles, corking them tightly, and after cutting off the corks flush with the mouths of the bottles, dipping the necks into a little melted wax or hard paraffin. The mucilage is thus kept free from air, and will be found most satisfactory in every way even after some weeks.

Oils are emulsified either by rubbing with gum or by adding

an alkali (which makes a sort of soap with the oil), or by both gum and alkali, which is the most common method. Copaiba is made into an emulsion in a similar manner. Volatile oils require to be mixed with some fixed oil before being made into an emulsion, or they may be rubbed up with yolk of egg.

The powdered gum and water, or mucilage, should be measured into a mortar, and the oil gradually added, with continual *light* rubbing, the pestle being always moved in the same direction, more oil being put in only after the first added has been blended with the water. Generally speaking, there should be as much oil as watery fluid at this stage.

If the mixture gets too thick during the rubbing, a little water may be added from time to time to thin it; and when all the oil is thus incorporated, the mixture is poured into the bottle in which it is to be dispensed, and any other ingredients ordered, are to be very cautiously added, each freely diluted before being poured in, tinctures or spirituous liquors always being added *last*, in very small quantity at a time, and diluted; neutral or acid salts, if ordered, must be very cautiously added, as they run a fair chance of spoiling the union of the oil and water, but many alkaline salts strengthen it.

The object of the dispenser should be to cause minute division of the particles of the oil, and to get each minute particle covered over with a film of mucilage or albumen, which prevents its uniting again with neighbouring globules.

Some dispensers put the powdered gum or mucilage into the bottle with a little water, adding gradually the oil, with brisk shaking; such a plan is not to be recommended. Alkaline emulsions, may, however, be prepared in this way, and it is the way in which copaiba is generally treated; the alkali, commonly solution of potash, mixed with as much water as there is balsam or oil, is put into the bottle, the balsam added, and after brisk agitation complete incorporation will be effected, the bottle being gradually filled up, with continual shaking. The balsam or oil is often weighed into the dispensing bottle, and this is the most correct method; but it should be remembered, if a *perfect* emulsion is desired, this plan should not be followed, as the oil or balsam adheres so firmly to the sides that globules will always be floating to the surface after the dispenser thinks that all is safe. This may be obviated by pouring the emulsion into a new bottle, after all the ingredients have been added.

Tincture of senega in small quantity has the power of emulsifying fats and oils very efficiently. 5 minims will emulsify ½ oz. of fixed oil.

Tinctura Quillaiæ possesses the same power, and is much used for making emulsions.

The mixture, having been compounded and put into the bottle in which it is to be dispensed, should be corked, and this must be done with care, as there are few things impress the patient so unfavourably as a cracked, dirty, or badly-fitting cork; the dispenser should take the measure of the neck of the bottle with his eye, before fitting the cork, and once it has been tried in the bottle it should not be put back amongst the others into the drawer, but regarded as a *soiled* cork. It is the custom to seal over the top of the cork with wax; coloured paper, leather, or tinfoil may be used; if leather is used in tying over a bottle it should be very thin, and put on quite wet, and without a single crease; it makes the most elegant finish, but is not commonly used. Labelling should be done with the most scrupulous neatness and distinctness, all flourishes being condemned. The margins of the label should be carefully trimmed, and a new label should never be put over an old one. A mixture should never reach a patient without being checked with care, when possible, by a second person.

CHAPTER III.

MIXTURES—*Continued.*

It might not be out of place here to refer to a few of the difficulties in Mixture-making which the student may expect to meet with. The following may be taken as examples:—

Quinine Sulphate in the form of a mixture is one of the most frequently prescribed drugs in the Pharmacopœia. Often it is ordered in combination with a little flavouring syrup and water, without any acid for its solution—and the officious dispenser occasionally falls into the error of adding sulphuric acid to effect its solution. This is a mistake. The quinine should be rubbed up in a mortar with a little water, or added to the vehicle in its crystalline state, with directions that the bottle is to be well shaken before each dose is poured out.

When an acid is prescribed for its solution, the careless dispenser may drop the quinine into the concentrated acid previous to dilution with the vehicle or water, and an acid sulphate, which is only sparingly soluble, is the result. The acid should be freely diluted before the alkaloid is added.

Or quinine may be ordered with tinctures, spirit of nitrous ether, or other spirituous liquids along with glycerin or syrup and water. In this case the alkaloid may be dissolved in the concentrated spirit, and the watery portions *gradually* added after the glycerin or syrup, so that if the mixture be not too dilute, a clear solution, instead of a muddy mess, may be presented to the patient.

Or quinine may be ordered with sulphuric acid and tannin, or some vegetable containing tannin, when a precipitate of tannate of quinine is the result. The dispenser should not fall into the error of filtering this latter out of the mixture.

Alkalies—Aromatic Spirit of Ammonia, Carbonates, &c.—are incompatible with quinine salts, the alkaloid being precipitated. Great care is necessary in compounding mixtures containing these ingredients. They should be well diluted before mixing and should be thoroughly shaken. A "shake" label should be put on the bottle. In a prescription of this sort the physician would help the chemist greatly by including a little mucilage.

Salicylate of Sodium, or **Salicylic Acid,** is occasionally ordered in a mixture with quinine, and the dispenser will find that a disgusting looking semi-solid mass forms in the bottle, and refuses to pour out. This latter case he should regard as one of absolute incompatibility, calling for a consultation with the prescriber. If this is impossible, matters may be partially remedied by adding mucilage to the quinine, and gradually mixing in the salicylate, dissolved in a large quantity of water, and shaking briskly.

Scale Preparations when ordered in a mixture should either be dissolved in a clean mortar, with warm water, or poured into the bottleful of the vehicle and agitated; if put into the dry bottle, and the water or vehicle added afterwards, a sticky mass cakes at the bottom.

Vegetable Extracts when prescribed in mixtures should be most carefully rubbed up in a *slightly* warmed mortar, with a little water, until a soft cream results, to which the vehicle is to be gradually added. If the extracts contain resinous matters, mucilage should be added by the prescriber.

Turpentine, or **Terebene,** will give the dispenser some trouble. If the emulsifying agent is left in his hands, he can make a good mixture with yolk of egg. It will require one egg at least for each ounce of turpentine. This applies to most ethereal or essential oils. Thick mucilage answers, but not so well. Turpentine has been successfully combined with a watery vehicle by rubbing it up in a mortar, with about 2 per cent. of powdered Castile soap, adding the watery vehicle gradually, and shaking briskly.

Almond Oil emulsifies unsatisfactorily with mucilage or powdered gum. A small quantity of liquor potassæ or potassium carbonate answers well, whilst a mixture of either of these with mucilage spoils an emulsion containing almond oil.

Spermaceti can be emulsified by rubbing it smooth in a mortar and adding a little spirit, just as in the powdering of camphor; after the evaporation of the spirit, yolk of egg, powdered gum, or thick mucilage—but preferably the former—will make a good mixture, especially if some syrup be present.

Cannabis Indica, Castor, Guaiacum, or other resinous tinctures, when ordered in the form of mixture, with directions for the use of an emulsifier according to the dispenser's fancy, will give some trouble. The best plan is to use a quantity of thick fresh mucilage, rather more than equal to the quantity of the tincture, which must be added only after dilution with water.

Borax, powdered and rubbed up with mucilage, forms a soft powder like moist sugar, which cannot be made liquid by the addition of any further quantity of mucilage, and acetate of lead, similarly treated, makes an opaque white jelly.

Spirit of Nitrous Ether will generally require to be neutralised with potassium bicarbonate before being compounded with potassium bromide or iodide, otherwise free Br. or I. will be liberated, and the mixture darkened.

Bismuth Subnitrate is often ordered in a mixture with sodium bicarbonate, and unless very great care is taken in compounding them, by permitting decomposition at a gentle heat, carbon dioxide will be produced, and the bottle will burst. This may be prevented by using an equivalent quantity of the bismuth carbonate, with the prescriber's sanction.

Liquid Extract of Male Fern is generally ordered to be rubbed up with milk, fresh mucilage, or tragacanth, but egg will be found a better emulsifier.

Tincture of Tolu, Friar's Balsam, or **Tincture of Myrrh,** may be easily added to cough mixtures, when a small quantity of powdered tragacanth is ordered at the same time, and though the scrupulosity of the dispenser in closely following the letter of his prescription is to be admired, still if gum were added sometimes on his own responsibility, the unsightly messes which are presented to patients either through the oversight or innocence of the physician would be greatly improved. Sometimes the relations which exist between the physician and the dispenser will quite justify the latter in making an alteration, but it is a dangerous ground, and he must always hesitate before interfering, unless where there appears a very evident necessity. Each case must be considered on its own merits, and no rule can possibly be laid down for the guidance of the young dispenser.

A Draught is a small mixture which is to be swallowed at one dose; it generally contains 1, 1½, or 2 ounces, and is compounded and dispensed in every way like a mixture.

Liniments, Injections, Lotions, Collyria or Eye Washes, and Gargles, are compounded in the same way as mixtures, and the dispenser will have no difficulty with them. All poisonous external applications should be dispensed in differently shaped bottles from those used for mixtures; the blue glass hexagons with three fluted sides are by far the best for this purpose, and less likely to be mistaken for mixture bottles than any other. Strong liniments, in addition to bearing the words, "for external use only," should be marked "poison." Injections, mouth washes, or unusually strong gargles, should be marked "not to be taken."

A Linctus or Lincture or Loch literally means any medicine of such a consistence that it has to be licked or lapped off a spoon. They are not now often prescribed, and when the dispenser meets with them he mixes the ingredients together as for an ordinary cough syrup or confection, and dispenses them in a plain bottle, or if too viscid for flowing, he puts them into a wide-mouthed bottle or ointment pot.

Electuaries, Conserves, or Confections, are mixtures of a pasty consistence, generally containing powdered substances made into a soft mass with treacle, syrup, honey, &c. The substances prescribed in this form, if not already in fine powder, must be reduced to this condition and sifted; sulphur, rhubarb, jalap, ginger, and magnesium sulphate are occasionally ordered in this form. The powders should be carefully triturated in a large mortar, and when thoroughly mixed the saccharine substance should be gradually added till a smooth, uniform, and impalpable paste is obtained. The powders should never be stirred into the treacle or honey, but the latter should be poured in upon the powder, and when compounded, the confection, if very soft, should be dispensed in a pot in which there is plenty of room for stirring up. If magnesium sulphate is ordered, the dispenser may use the dried salt, allowing for its extra strength, as it is almost impossible to pulverise the ordinary drug.

CHAPTER IV.

THE COMPOUNDING AND DISPENSING OF POWDERS.

THOUGH nearly every vegetable substance in the Pharmacopœia may be prescribed in the form of a powder, still the list of commonly ordered powders is not a very long one. The physician may order substances to be dispensed in this form which are not kept in powder, and the dispenser will consequently be obliged to pulverise them. This is done on the small scale by using a mortar like the one in Fig. 5; the pestle is grasped in the same manner, but wielded very differently; it is raised and lowered in a quick or jerky fashion for a few inches, and in a straight up and down motion from the elbow, each stroke being aimed at a particle, which is thus crushed between the end of the pestle and the bottom of the mortar. When the coarser pieces have disappeared, the pestle is to be used as in Fig. 6, and the powder ground between the sides of the mortar and the end of the pestle till the required fineness is obtained. The mortar for such an operation should be of wedgewood, and not too highly polished, as the roughness of the interior facilitates pulverisation.

If the substance to be powdered for a prescription happens to be a root, or leaf, or herb, which is rare (as such are almost always kept powdered in stock), then an iron mortar with a lid is to be used, for any considerable force should not be employed with a wedgewood or porcelain pestle. After the grinding has been performed till single particles are no longer visible to the naked eye, the powder should be passed through a fine sieve, and for very small quantities it is sufficient to extemporise a little sieve by stretching a piece of fine muslin over a large chip ointment box, out of which the bottom has been knocked, and securing it with a string or tight hoop like a drum head.

The bulk of a powder varies. Generally prescribers order less than twenty grains, often about five grains are prescribed. If only one powder is to be sent to the patient, it is simply weighed on the scale and placed upon a piece of paper, and, if containing more than one ingredient in a single powder, they should be carefully mixed on the paper with the point of a knife, for though the patient is to swallow the entire powder without division, and its mixture is practically of no importance, it looks careless, and does not impress him favourably on being able to distinguish different shades of colour in what he is about to take. Powder papers should be glazed, and

for small powders, about 4 × 5 inches. Different shades of colour are used, and some even prefer the paper unpolished. As a rule, paper such as is used for writing on is suitable. The white glazed demy, manufactured specially for the purpose, and sold by druggists' sundrymen, is the best powder-paper. It may be had cut in different sizes. To fold a powder requires a good deal of care and practice, and once learned it is never forgotten, and is useful when applied to many other little operations. Though so simple, it is, however, a difficult task to describe in writing.

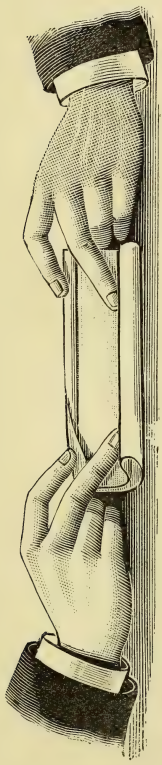


Fig. 7.

The following is the old-fashioned way of folding a powder:—The powder being placed on the centre of a paper, which lies flat on the counter before him, the folder seizes the margin farthest from him between the second finger and thumb of his left hand, at the same moment seizing the near margin with the corresponding fingers of the right hand; he brings them together, their edges looking directly upwards, only the edge of the margin nearest is half an inch higher than the edge which is farthest off him (Fig. 7). The margins are held in this position with the second finger and thumb of each hand, while the folder turns down in a flap with his index fingers the upper margin over the lower. (The figure shows this turning down as having commenced at the right hand corner). The flap thus produced is turned over upon itself, which finishes the folding process, except the bending down or in of the ends, which is done, as Fig. 8 describes, by simply bending them between the finger and thumb, or by creasing over a powder-folder made for the purpose, which secures all the powders being of exactly the same length. Some dispensers bend down the ends over a flat-

bladed knife. After the powder is thus folded, its appearance is much improved by passing the blade of a spatula or ivory paper knife firmly and rapidly over it, removing every crease, and preventing the mass of powder causing a bulging in the

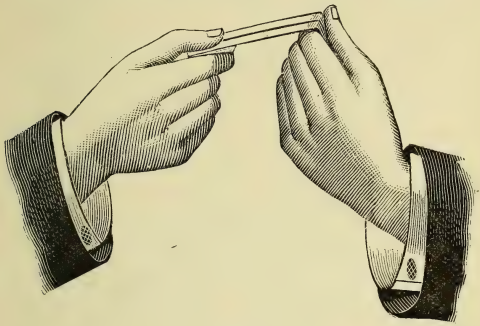


Fig. 8.

middle. This is always necessary when the powder weighs more than a scruple, and it is especially necessary when any considerable number is ordered to be dispensed in a box or envelope. Care is requisite in passing the spatula over bulky powders to keep the blade perfectly flat or horizontal, as otherwise its edge will readily tear through the paper. Very large powders, containing substances like Rochelle salt, sulphur, &c., can be uniformly flattened by striking them gently several times with the handle of the knife before passing the blade over them.

Pharmacists, however, nearly universally fold a powder in this way :—The dispenser places the paper before him on the counter or table with the powder in its centre, and brings the border of the paper farthest from him to within half an inch of the border next him ; secures it in this position with his index fingers, whilst with his thumbs he turns the half inch of margin of the paper next him in a flap over it. This is again folded over on itself, which completes the folding (Fig. 9), the ends being turned down as in the first instance by the fingers, over a knife or on a powder folder.

A represents the farthest edge brought towards the folder ; in B the edge next him is turned over in a flap upon this ; in C and in D both are together turned over in a second flap ; and the folding is completed except the turning back of the ends.

The dotted lines show the space originally covered by the paper. In this method the powder is technically said to be folded "to" the dispenser. Most commonly, however, it is folded "off" him, and this is the proper way, only it is more difficult to accomplish it for the first time. It is done in the same way

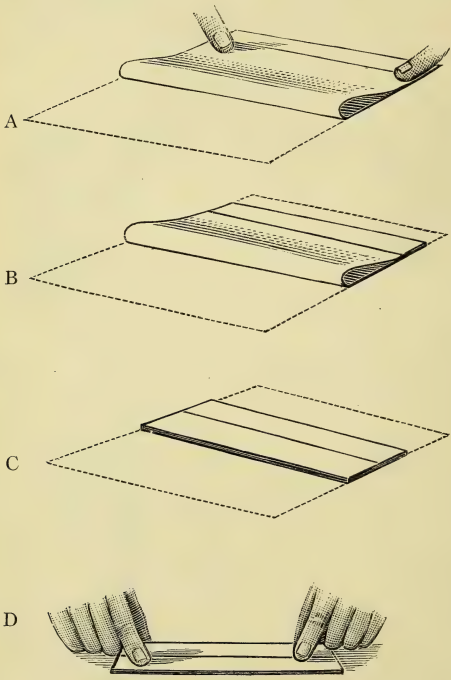


Fig. 9.

precisely, except that the near edge of the paper is brought to within half an inch of the farthest edge, which is turned over on it, and again both are turned over as before.

The following still simpler method of folding a powder may be easily mastered by the student :—He places the paper before

him with the powder in its centre, and turning back into a flap about half an inch of the margin next him, he smooths it down flat upon itself. Into the crease of this flap he inserts the edge of the paper farthest from him, and bends both over exactly as in the two previous instances, and finishes the ends as before.

The first method is the most difficult to accomplish, but it is the best, as by it the dispenser folds large bulky powders, like magnesia, Gregory's powder, &c., which cannot be properly folded otherwise. Suppose 1 oz. of the sulphate of magnesium is to be dispensed in a paper, the dispenser weighs it out on a paper, and proceeds exactly as in the first instance of folding a small powder, as in Fig. 7. He does not, however, fold back the ends over a folder, but gathering in loosely the left end, he closes it so that the packet can stand upon it, like an upright cylinder open at the opposite end. Into this end he inserts his right index finger, and folding the paper round it, he withdraws it, causing the end to retain the creases into which it falls. He then bends down the folded-in flap, and undoes the end upon which the packet was standing, which now goes through the same process as the right end, after shaking down the contents and making the surface even. Practice only will enable the dispenser to fold a packet in this way, as it is impossible to clearly describe it in a book. The little time lost will be amply repaid by the education which the fingers receive.

If more than one powder be ordered, the dispenser proceeds in a different way. Suppose, for example, twelve five-grain Dover's powders are to be dispensed, two ways are open to proceed. First, spread twelve papers out on the dispensing counter in four rows of three each. Weigh 5 grains, and place them on each paper till the dozen powders are weighed out. Then begin to fold one after another till all are finished. This is a tedious plan, for which the expert and experienced dispenser sometimes substitutes the following:—Weigh 60 grains, place it on the centre paper, and divide the heap with a knife into twelve portions, now adding a little to one and taking some from another, till the *eye* is satisfied that all are equal; or, till a little practice is obtained in this method, weigh out 30 grains twice and divide each into six papers. It is surprising how the eye so soon becomes educated to discriminate small differences in the size of the powders. This method, however, is not applicable to large powders, and should only be practised after very considerable experience of weighing; the writer cannot recommend it, especially to the student, and it is condemned by high pharmaceutical authority.

Ordinarily, in prescribing powders, the medical man writes the form as if for one powder, and then directs, say, twelve such to be sent; hence twelve times the quantity of each substance

is weighed and put into a mortar, generally in the order in which it is prescribed, for as a rule it matters little in what order the ingredients are mixed, provided they have been previously in a state of fine powder. But if a very small quantity of an active ingredient be prescribed, it should first be put into the mortar with about twice its bulk of some of the more inert ingredients; and after careful trituration, using the pestle as shown in Fig. 6, the remaining substances are gradually added. Substances which are not in powdered form should be first rubbed down finely, and then mixed with the other ingredients. The mass of the powder should not be divided until the most thorough admixture has been accomplished.

Should a drug, *e.g.*, potassium bromide, be ordered as a powder it is desirable to pulverise it to destroy its identity, and not send it out to the patient in crystalline masses.

Sometimes the physician orders a certain weight of the different ingredients to be mixed and *divided* into a number of powders. Here the dispenser might make a terrible mistake if he multiplied the quantity by the number of powders instead of dividing, and he should be always on his guard against such an accident. Substances which are perishable, as ergot, are sometimes ordered to be dispensed in this form; or substances which are volatile, as camphor; or deliquescent, as carbonate of potassium; or liable to chemical decomposition, as sulphide of calcium, or the valerianates; in which case they should be folded up in the ordinary paper first, or, preferably, in waxed paper, and then each one covered with tinfoil, and sent out in packets of 4 or 6, which are again covered with an extra piece of the foil, and if to be kept for any time they should be enclosed in a wide-mouthed bottle.

Sometimes a powder like Gregory's, ginger, soda, rhubarb, &c., is prescribed in quantity, with directions for a teaspoonful or other dose; or powdered borax is prescribed for injecting. In such cases the dispenser should send it to the patient in a wide-mouthed bottle, well corked, or even in some instances in a bottle with a glass stopper.

When as many as six or eight small powders are ordered they should always be folded exactly of the same length on a folder, and sent in a cardboard box. Numbers under this are generally dispensed in small oblong envelopes, made for the purpose, and on which the directions can be written like the address on any ordinary letter. If sent in a box or bottle, a small label is gummed on the outside.

CHAPTER V.

COMPOUNDING AND DISPENSING OF PILLS.

THIS is perhaps the most difficult work of the dispenser, from the complexity of the process through which the mass has to pass before the finished pills are in a proper condition to be presented to the patient, and partly also because he is often left completely to his own resources to unite in a pilular form ingredients unsuitable and without any cohesive property. Pills should be perfectly spherical, and should not be larger than can be readily swallowed without chewing; each should not exceed 5 grains in weight, unless the ingredients are exceptionally heavy—as calomel, bismuth, reduced iron, blue mass, &c.—when 8, 9, or even 12 grains may be with skill compounded in a fair-sized pill. On



Fig. 10.

the other hand, as many as 5 grains of a light vegetable powder will be sure to make too bulky a pill, as the weight of the excipient or material added to give body must be taken into account. The choice of the excipient is often left to the dispenser, and some experience is necessary to guide him in his selection. The most common are: gum or mucilage, soap,

syrup, spirit, glycerin of tragacanth, or some soft extract, as gentian, inert in very small doses.

Mucilage, a commonly used excipient, is well adapted to make vegetable powders into pills, but, as a rule, its use should be restricted to pills that are soon to be consumed—otherwise they will get very hard and insoluble. For mineral powders it is not so suitable, as the pills made in this way are apt to flatten, or "fall."

Tragacanth is a very good excipient; in the form of the compound powder it is especially so when added to masses which are already too soft, as it gives body and elasticity; but if used too freely, the pills retain the cylindrical form, and after a short time may lose all trace of rotundity. Tragacanth and water give good consistence to substances like nitrate of bismuth.

Honey and Treacle are used in preference to mucilage, as they make nearly as good a body, but with less risk of becoming hard.

Tincture of Gentian and Treacle, equal parts, make an excellent excipient, giving firmness and toughness, and ensuring solubility. It is particularly suitable for quinine.

Syrup is used for the same purpose when very little room is left for the excipient, but it makes crumbly masses with metallic salts.

Soap makes an excellent pill when added to resinous substances; it does not get hard, and is not apt to crumble, unless a substance like sulphate of iron be added.

Sawdust finely sifted has been highly recommended by Mr. Proctor, as an excipient to give toughness to soft masses; it imparts great retentiveness of shape, with little increase in size.

Glucose has been recommended by Mr. Lascheid.

Spirit is used in working up resinous substances; it is, however, very difficult to work with, as there is great danger of adding too much, which causes the mass to "drop," and if too little be added no effect is produced at all.

Decoction of Aloes. A very few drops of this liquid make a workable mass with aloes and gum resins. Care must be taken that the mass contains no substance which is incompatible with the carbonate of potassium in the decoction.

Kaolin is of great use in making a mass with substances which ordinary excipients decompose, as Pot. Permang., Argent. Nit., &c.

Liquorice and **Marshmallow** in powder give elasticity to soft masses.

Glycerin in very minute quantity occasionally assists dry crumbly masses; it is treacherously hygroscopic, but this difficulty is overcome by mixing with it ⅛ of its bulk of water.

Glycerin, Mucilage of Acacia, Water, and Alcohol (90%), in equal parts, make a good all-round liquid excipient.

Wax melted or in shavings makes a beautiful mass with creosote, camphor, carbolic acid, and most essential oils; it, however, makes an indigestible pill, and is not to be recommended.

Water is a dangerous excipient to use except in cases where a powdered gum is present, as it forms a brittle pill liable to flatten. It is excellent for making powdered opium into a mass.

Bread-crumb for croton oil and carbolic acid, **Basilicon Ointment** for the scale preparations, **Confection of Roses** for vegetable powders, are deservedly little used now.

Calcium Phosphate is recommended in small quantities to give pilular consistence to greasy substances.

The dispenser will see that he has a long list of excipients, but a little experience will soon teach him that when he gets to *know* an excipient he can do almost anything with it; and most pill-makers have their favourite.

Proctor's Paste.—The writer, in recommending an excipient for *general purposes*, believes that none can be found equal to a paste made of—Powdered tragacanth, 1 dr.; glycerin, 3½ drs.; water, 1 dr.

It improves by keeping. The inexperienced dispenser will be amazed how little of this substance will be sufficient to give consistency, toughness, and retentiveness to the most unpromising mass. The B.P. glycerin of tragacanth may be used instead.

The dispenser, having read over the prescription, and thought of the excipient which he will use, if such is not already directed by the physician, proceeds now to weigh the different ingredients, taking the substances that require pulverisation first; when all the dry ones are thoroughly mixed, the soft extracts are added, and the mass worked up in a mortar.

The proper mortar is figured at the beginning of this chapter. It is very shallow, there being one mortar or shallow depression generally in each end of it; it should be of unpolished wedgewood ware, and very thick, with a long, though small pestle—which is to be worked in a totally different way from any yet mentioned—the pestle being used as a lever, with the edge of

the mortar next the operator as a fulcrum ; and great force is necessarily applied, in order to squeeze the substance between the end of the pestle and the side of the mortar at each stroke, the mortar being firmly grasped by the left hand and turned round occasionally, so that all parts of the pill mass are exposed to the action of the pestle. By vigorous manipulation the heat produced by the friction so softens the mass that less excipient is necessary to produce a workable pill. It will thus be seen that the process is one of squeezing or kneading rather than pounding.

The student will do well to review at this place the different methods of using the mortar and pestle, as required for different results, and a little reflection will teach him more than a year's blind practice, for unless he has some idea of the scientific action of the machine, he can scarcely chance to wield the pestle efficiently or gracefully. It is used in at least four different ways :—1.—(As shown in Fig. 5.)—The pestle is grasped firmly, the wrist and elbow joints kept almost rigid, while the pestle is made to traverse the sides and bottom of the mortar, all the motion being at the *shoulder* joint (circumduction). 2.—The pestle is grasped in the same way, the wrist and shoulder joints are fixed, while the fore arm is raised and lowered alternately—as a gold-beater uses his mallet—all the motion being confined to the *elbow* joint (Fig. 5). 3.—The pestle is grasped like a pen, and with a light, quick, easy motion at the *wrist* it sweeps round the inside of the mortar (Fig. 6). 4.—The pestle is grasped by the fingers, the expanded end of the handle being firmly planted against the centre of the palm, its middle resting against the inside edge of the mortar, when the three previous movements are executed, and the pestle is driven slowly and forcibly against the opposite side of the mortar—the pill mass being between —here *shoulder*, *elbow*, and *wrist* are vigorously in motion (Fig. 10).

The ingredients being worked into a uniform stiff mass in the mortar, are to be scraped out, if necessary, with a small stiff spatula, and it is a good plan to work the mass for a few minutes between the fingers, in order to soften and toughen it. It is next rolled into a ball or cylinder with the finger and thumb, and transferred to the marble slab of the pill machine, on which may be dusted a little finely-powdered French chalk, starch, or lycopodium ; the back of the handle of the machine is used to roll it into a long cylindrical form (the pipe), great care being required to prevent the cylinder tapering out thin at either end ; a very light and quick motion backwards and forwards will prevent this—the handle being held perfectly horizontal as shown in the sketch (Fig. 11), and each hand bearing an equal weight on the mass as it is rolled backwards and forwards over the slab. It is brought from time to time alongside the scale, and when the number of

pills into which it is to be divided corresponds with the number marked there, it is gently lifted or rolled with the fingers on to the grooved part of the machine ; the handle, with its grooved

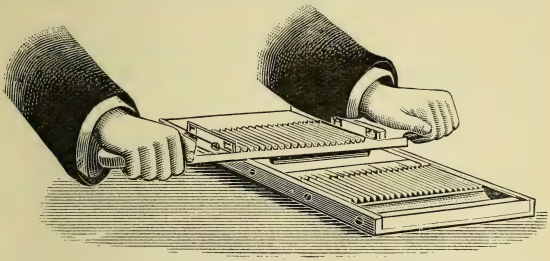


Fig. 11.

surface downwards, is laid on it, and by a series of rapid and short movements, with both hands, abruptly brought to a close by pushing the handle from the dispenser, at the same time

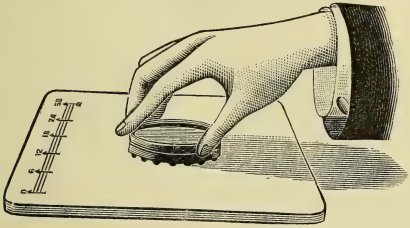


Fig. 12.

turning it on its own axis in his hands, the cylinder is cut and rounded into globular pills, which, with the last motion, are pushed into the box or tray at the end of the machine. If the operation is successful, and the mass of good consistence, no further handling will be necessary ; but generally the track of the machine will be visible on each pill, and another process is required before the smooth globular form is perfect. The pills are again placed on the dusted slab, and covered with a pill-finisher—which is only a circular shallow boxwood tray, not so deep as the pills—and by a series of rapid rotatory move-

ments the traces of the machine are dispelled, and a more spherical and polished appearance is given. (Fig. 12.)

If the pills are very soft this cannot be successfully done, but they must be rounded separately between the finger and thumb.

There is another and more convenient method of making pills in small quantities; it is by means of the graduated tile and a spatula. The ingredients are weighed and placed on the tile—which is of porcelain or wedgewood ware, with very little glaze on its surface.

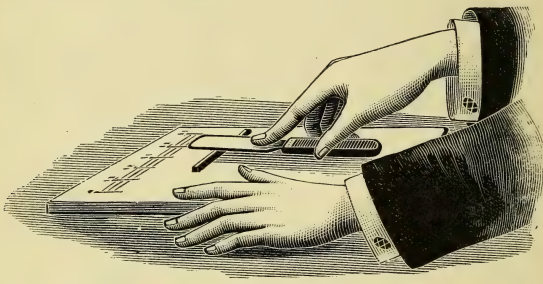


Fig. 13.

With the square end of a stout spatula, technically called a spud, the mass is worked into a uniform consistence, and, after a little kneading with the fingers, it is rolled out between the blade of the knife and the dusted slab, brought to the scale and cut into pieces, which are rounded into pills between the thumb and next two fingers of each hand. Figure 13 shows the rolling out process. Or the mass may be made in the pill-mortar, and transferred to the tile, where it can be rolled out and cut.

By submitting the tile to a uniform heat—viz., by immersing in hot or boiling water and rapidly drying, hard masses which could not be otherwise brought into the pilular form, can be easily softened by kneading between the end of the spatula and the heated slab. In this way also small quantities of soft extracts can be dried or hardened by being spread out in a thin film on the *warm* slab, but great care is required lest the active principle of the extract be injured by the heat and exposure. Some pharmacists prefer a tile made of metal.

Machines are now made on the cylindrical roller principle, by which as many pills can be prepared in an hour as the old-

fashioned machine could turn out in a day, but they are only useful where very large quantities are to be rolled out at once.

The pills having been prepared as described, should be left out to dry (unless urgently required), either on the slab of the pill machine, or in some dry and warm place, whilst the label is being written and the box prepared in which they are to be dispensed. The box should be large enough to hold them in a single layer, otherwise they will be liable to stick or become flattened. Pills containing volatile ingredients should be always dispensed in a bottle, of which there are many kinds manufactured for the purpose with wide mouths. If uncoated, some powder must be put into the box or bottle to prevent them adhering to each other or to the vessel, and different dispensers are in the habit of using different powders for the purpose. Chalk, lycopodium, flour, liquorice, &c., are used; powdered French chalk will probably be found to be the most elegant and efficient.

CHAPTER VI.

PILL MAKING.—*Continued.*

THE coating of pills has become much more general of recent years, and various substances are employed for the purpose. Perhaps the most general coating is French chalk or talc, either alone or sweetened with sugar or saccharin. Sugar alone is also employed, but it requires more practice to be proficient in its use. Albumen is occasionally resorted to, and the same may be said of coating with silver leaf, which was the favourite prior to the introduction of pearl coating, which is the name sometimes given to coating with chalk. Gold leaf is rarely used as a covering for pills. Gelatin is frequently employed, and often a physician orders keratine-coated pills. Yet another covering for pills is varnish composed of tolu, sandarach, or mastich (or a combination) dissolved in ether. This last process tends to render the pills insoluble, and hence is condemned.

Whatever the coating employed, the pills should be hard, else discolouration occurs either from saturation of the white coating with moisture from the coloured pill substance, or by reaction between the ingredients of the mass and the silver leaf.

Frequently, and this is especially so in Extemporaneous Pharmacy, pills cannot be kept in shallow trays to harden, and, as a consequence, the plan is sometimes adopted of giving a coat of varnish, and, as soon as that is dry, to proceed with the pearl or other coating. Such a practice is not to be advocated as it renders the pills insoluble.

Pearl Coating.—On the small scale as practised in Extemporaneous Pharmacy, splendid results can be obtained by the following process:—Having cut and rounded the pills, they should receive a covering of mucilage of tragacanth or of acacia (the former is preferable, producing a whiter coat); by transferring them to the palm of the left hand, a drop of the mucilage is placed on the ball of the thumb, and with one finger of the right hand the mucilage is applied to each pill. By this plan the quantity can be accurately gauged, whereas to pour the mucilage on to the pills the covering is not so likely to prove evenly distributed. Having received the coat of mucilage, they are thrown into some talc, which has been placed upon one compartment of the pill rounder (the other is kept perfectly clean). The rounder is then gently revolved in its own plane, care being taken to separate any pills which adhere to one another. By this means the coat is applied evenly over the pills. When they cease to take up chalk they are transferred to the clean portion of the rounder, where they are polished. The best method of doing this is to place over them a piece of glazed wrapping, or silvered paper, and with the finger tips placed over the paper the pills are rotated, and a brilliant polish is thus given to them, care being taken to keep the paper between the tips of the fingers and the pills during the process, and to use only light pressure. The polish will be permanent if time permits of the pills being allowed to dry in a tray for ten or twenty minutes, provided that sufficient moisture has not been present in the mass to discolour the coating. It is sometimes necessary to give a second coating, but practice will enable the pharmacist to judge of the consistence required to obtain desirable results, and of the amount of mucilage and chalk needed.

Instead of the above process, the pills may be moistened with mucilage in a shallow, flat-bottomed dish, and transferred to another dish containing talc, and the polishing carried out by finishing them on a polished slab with the rounder.

To give a more brilliant finish to pearl-coated pills, it has been suggested to very lightly roll them in a dish in which has been melted a small quantity of hard paraffin, and then allow them to dry. This, however, is scarcely advisable. The admixture of starch (1 dram.) with talc (1 oz.) gives a whiter coating than simple chalk, or the talc may be tinted by the addition of any harmless colouring agent.

In larger quantities other apparatus is generally employed. The pills are moistened with mucilage in a large covered pot, and then transferred to a "pill coater." The coater is used both to coat the pills and to polish them, or they may be polished on a slab with a rounder.

The process is the same if sugar or saccharin be mixed with the chalk.

It is hardly necessary to say that no loose powder should be put into the box or bottle in which coated pills are dispensed.

Sugar Coating requires practice before much success can be obtained. The *modus operandi* consists of moistening the pills thoroughly with syrup, or a mixture of syrup and mucilage, in a pill coater, carefully heating in a bunsen flame, whilst the pills are constantly revolved, and powdered sugar added from time to time until a hard white coating results. Or if the pills be covered with a film of mucilage, syrup, or gelatin, and turned into a circular box containing finely-powdered sugar and starch in equal quantities, brisk circular movement for a few minutes is all that is necessary; the addition of a little finely-powdered tragacanth to the starch and sugar gives a more elegant finish.

Silver Coating.—To properly coat pills with silver requires some neatness and care. The following directions, if followed, will give a successful result:—There should be no trace of powder about pills intended to be silvered. The silver leaf as it lies flat in the book in which it is originally supplied by the manufacturer, is exposed, and each pill is rolled between the thumb and the next two fingers, which have been previously rubbed against a little mucilage dropped on the slab of the pill machine, and when a sticky layer is felt to be imparted to the pill, without being so abundant as to drop off or run, it is allowed to fall on the silver leaf, and another treated in the same way, until twelve or fifteen pills are dropped at equal distances apart on a single leaf.

The silver leaf with the pills on it is allowed to quickly slide off the book into a spherical, or egg-shaped, boxwood vessel, which is to be shaken cautiously, the hand containing the box being turned round, making a circle in the air, for about one minute, so as to cause the pills to run round its inside, when an even and lustrous coating of metallic silver will be seen adhering to and completely covering each pill. Any loose fragments of leaf can be blown away, and after a short exposure to the air on the slab, the pills may be enclosed in the bottle or box in which they are to reach the patient. Gold may be applied in the same way. Pills containing blue mass in any considerable proportion should not be silvered, the mercury making an unsightly amalgam with the silver leaf. Asafetida, when coated, turns the silver black, and consequently gold should be used.

Gelatin Coating.—Various arrangements are made for rotating the pills after they have received their coating. The general process is briefly:—Each pill is impaled upon a needle point and dipped into a solution of gelatin (one of gelatin with

two of water) liquefied by heat. It is rotated in the air for a few moments and set aside to harden. When the needle is withdrawn its mark is closed with a little fresh gelatin. By employing discs of cork, metal, &c., with numerous points, pills can be expeditiously coated in this way.

Keratine Coating.—Pills are coated with keratine, as originally recommended by Unna, when the physician desires that they shall pass through the stomach undissolved, so that their effect may be produced upon the intestine, in the alkaline secretions of which they will become disintegrated. Keratine is obtained from horn shavings by treatment with pepsin and acid, dissolving the residue in ammonia solution, and evaporating until almost all the ammonia is driven off. The resulting solution is that used for pill coating. Only oily excipients should be used in making the pills, and Martindale recommends that they get a thin coating of cacao butter first, and then three coats of keratine solution, each coat, of course, being allowed to dry before the next is applied, by shaking in a pot or dish with the necessary quantity of solution and throwing on to a slab to dry.

A **Bolus** is sometimes ordered in a prescription, as 10 grs. of quinine may be prescribed by the physician, with directions for the dispenser to make it into a "bolus," with honey, treacle, syrup, or any thick fluid. In England such a dose is sent out to the patient in one large, firm pill; but often in Ireland, and elsewhere, the pharmacist adds a sufficient quantity of the liquid substance to make a soft paste, like a confection or linctus, which he encloses in a piece of waxed or oiled paper, folded like a powder, with directions that it is to be scraped off with a spoon, and bolted or swallowed like jam. It is at the best an inelegant and often disgusting form of administering medicine. The ordinary wafer papers, sold in circular boxes, afford an easy, elegant, and inviting method to the patient, whereby he can swallow the most nauseous powders, pills, or boluses, without tasting them. The wafers are composed of flour and water, which become limp when wetted, and they can be readily wrapped around the nauseous morsel and swallowed as easily as a spoonful of pudding.

The student will often be puzzled in compounding pills, especially as no rules can be laid down for his guidance in selecting an excipient for every case. The following are a few of the difficulties, and their solutions, which he may meet:—

Strychnine or other powerful alkaloid is ordered in minute quantity, say $\frac{1}{32}$ grain. It should be rubbed up with a little sugar of milk crystals to fine powder, and after the addition of about $\frac{1}{4}$ gr. of liquorice powder, Proctor's paste, extract of gentian

or mucilage, will make a mass. The dispenser should have a rule of *making the gross weight of such pills up to one grain each.*

Aloes in any quantity in a mass is best made up on a heated slab with proof spirit or decoction of aloes in *minute* quantity.

Butyl Chloral Hydrate should not be treated with the tragacanth paste, which dissolves it and causes the pills to flatten. It is best worked up with a little confection of hips and thick mucilage.

Croton Oil makes a good mass with powdered liquorice and mucilage or with bread crumb.

Extracts, when ordered without any powdered or dry substances, can be made into pills with gentian or liquorice powder.

Gallic Acid 5 grs. (in fine powder) and glycerin ½ drop make a good pill.

Iodide of Potassium should be rubbed up with a few drops of water into a smooth paste, and made into a mass with a little liquorice powder ; 6 grs. may thus be got into a fair-sized pill. The proportions of liquorice and water will depend upon the sample of iodide, as this salt varies much in its suitability for making pill masses.

Phosphorus should be dissolved in bisulphide of carbon, and whilst solution is being effected two or three drops of chloroform may be added, which produce a heavy vapour around the solution and prevent oxidation of the phosphorus by the atmospheric oxygen. A little liquorice powder is now added, and the mass quickly made into a workable form with Proctor's paste, divided into pills and varnished. Phosphorus is made into a pill by some pharmacists by melting it in cacao butter or mutton suet, and, when cold, beating it into a plastic mass, to which a little powdered liquorice may be added.

Quinine 8 parts, tartaric acid 1 part, with q.s. of Proctor's paste, make a mass much less liable to crumble and of less bulk than if the acid be omitted. They soon become insoluble.

Camphor must be powdered with a few drops of spirit, and Proctor's paste added *after the spirit evaporates.*

Carbolic Acid may be easily made into a mass with 1½ grs. wheaten flour to 2 grs. of the crystallised acid, or with bread crumb, or with powdered marshmallow or elm bark, to which a trace of Proctor's paste is added.

Creosote is made into a mass by Martindale by adding animal soap, and heating on a water bath. Powdered liquorice, to which a few atoms of beeswax are added, affords a plastic

workable mass. If ordered in a pill with oxide of silver, creosote will explode unless the oxide be first diluted by trituration with some inert powder like liquorice or gentian.

Copaiba can be made into firm pills with a little carbonate of magnesium. They soon become insoluble.

Citrate of Iron and Quinine can be best quickly worked up with the smallest possible quantity of spirit and water, mixed in equal proportions.

Calcium Sulphide should be mixed with an equal quantity of sugar of milk, and, after careful trituration, as much powdered decorticated liquorice root added as will make the weight up to, say, a grain. The mass can now be worked easily with a little tragacanth paste. Sugar of milk makes the best powder to aid the sub-division of an active substance, and the powdered decorticated root of liquorice is the best inert powder for making up pill masses, as it is so fine that it does not make a crumbly pill.

Rhubarb Powder makes an elegant mass with $\frac{1}{5}$th its weight of glycerin.

Tannic Acid can be manipulated with $\frac{1}{3}$th its weight of glycerin and about $\frac{1}{10}$th part of mucilage.

Permanganate of Potassium, in a pill, requires much care at the hands of the dispenser, as it yields oxygen in contact with organic matter ; it may be finely powdered and made into a mass with cacao butter and a little soft paraffin. Resin ointment makes also a good mass. Martindale advocates an excipient of soft paraffin, hard paraffin, and kaolin, whilst Proctor only uses kaolin and a little water.

Where the dispenser has the choice of an excipient in pills which are not to receive a coating of any kind, he should select an excipient which will not alter materially the colour of the mass ; thus, quinine, bismuth, camphor, and all white substances should be made into a white mass when practicable.

CHAPTER VII.

THE COMPOUNDING AND DISPENSING OF OINTMENTS.

THE making of an ointment is generally a very simple matter, only requiring perseverance and painstaking, which always repay the dispenser. It is often a matter of simple trituration ; and a pestle and mortar, with a spatula, are all the implements

required. Rarely, if ever, will the extemporaneous ointments ordered by the physician require any melting.

If two ointments, or an ointment and a liquid or oil, are ordered to be mixed, the simplest method of procedure is to weigh and measure the ingredients out on a porcelain slab, and thoroughly blend them with a long spatula. This will answer in many instances, but the dispenser is cautioned against making extracts, powders, or gritty substances into an ointment in this way.

In such cases the substance to be incorporated with the fatty or oily basis is put into a mortar and ground with some minute quantity of excipient to the finest conceivable state of subdivision, and by far the best excipient ever devised is a little of the old-fashioned "elbow-grease." The pestle should be worked as shown in Fig. 5, and the mortar should be capable of holding very many times more of the ointment than is about to be made. When the powder, or extract, or crystal is put into it, it is subjected to firm powdering or rubbing. A very little of the fatty basis is added, and trituration continued till a smooth, impalpable paste is obtained; then the remainder of the basis is added gradually, sweeping the sides of the mortar and pestle from time to time with a spatula, so that all is thoroughly mixed. Often, however, it will be necessary to add something to facilitate the grinding before adding the ointment: thus, if camphor is ordered, it must be rubbed very fine by the aid of a little spirit which evaporates during the mixing. If an extract is to be added to an ointment it is first put into the mortar and rubbed to absolute smoothness with a little spirit, water, or glycerin, before adding the unctuous basis. If the extract is hard, or even of pilular consistence, the best plan is to previously warm the mortar by pouring hot water into it, and drying quickly with a cloth, when the extract can be rubbed to smoothness before a little of the basis is added. Soluble crystals, like iodide of potassium or carbonate of potassium or sodium, are triturated with a little water before adding the remaining ingredients. Iodine should be rubbed to powder, a few drops of spirit added, and the trituration continued. Iodide of sulphur should be most perseveringly rubbed down with a little olive oil, borax with a little glycerin, and red precipitate with distilled water.

Volatile liquids should be added after the other ingredients are well mixed, so that evaporation is reduced to a minimum, as in the case of Prussic acid and chloroform.

Steel knives should not be used in the preparation of ointments with the alkaloids, or with acids, or especially with the acid nitrate of mercury, red precipitate, or yellow oxide of mercury ointments, which are ruined by the touch of iron. Many fine and pearly compounds made with cold cream are well prepared

by mixing them up in a china cup with a silver or gilded spoon, and it is a safe rule for the young dispenser to use a bone or boxwood knife in making all ointments.

This is not intended as a complete list of the difficulties and their remedies in ointment making; but the writer has deemed it wise to enter more fully into the subject than its simplicity might apparently warrant, for just because the preparation of this class of compounds appears to be very easy, so are they often carelessly compounded, to the vexation of the physician and the annoyance of the patient. It is not at all an uncommon thing to see sores irritated and eyes inflamed by the very remedies prescribed to soothe them, the coarse angular particles acting like so many little setons. It is hardly necessary to say that any ointment with the least trace of rancidity should not be compounded by the dispenser.

When the mixing has been finished the ointment is scraped out of the mortar with a bone or wooden spatula, or horn ointment scraper, and generally dispensed in covered porcelain pots, and unless of very firm consistence, a piece of waxed paper should be inserted between the ointment and the lid, and pared neatly round. If it is at all approaching the fluid state a wide-mouthed bottle will be the best vessel. Occasionally, for the poor and in hospital, the common chip box is used.

CHAPTER VIII.

COMPOUNDING OF SUPPOSITORIES, PESSARIES, AND BOUGIES.

SUPPOSITORIES are seldom ordered except in the Pharmacopœial form; but, as even these should be prepared by the dispenser himself, a passing notice may be made of their preparation. They are generally made in conical moulds, should weigh about 15 grains each, having cacao butter for their basis, and such other firmer substance, to enable them to solidify rapidly after being poured into the moulds; this latter *desideratum* is assisted by having the moulds made of a massive block of gun-metal, which causes their rapid cooling (Fig. 14). The ingredients should be treated as if an ointment was to be made; any powder or crystalline substance being rubbed to fineness with a little lard or a trace of the butter in a mortar or on a slab, whilst the remainder of it is being melted in a small cup on a water bath with the wax; only enough heat must be used as will barely melt them, and when they begin to show signs of congealing the triturated ingredients may be

added with a vulcanite or bone knife, and stirred constantly till a creamy mass is obtained, which is to be poured into the moulds. If the moulds are previously dipped in ice water, or in a little freezing mixture, made by dissolving sal ammoniac in water, the subsequent detachment of the congealed substance will be expedited. This latter part often gives trouble, the suppositories persistently adhering to the mould ; various plans are tried, and

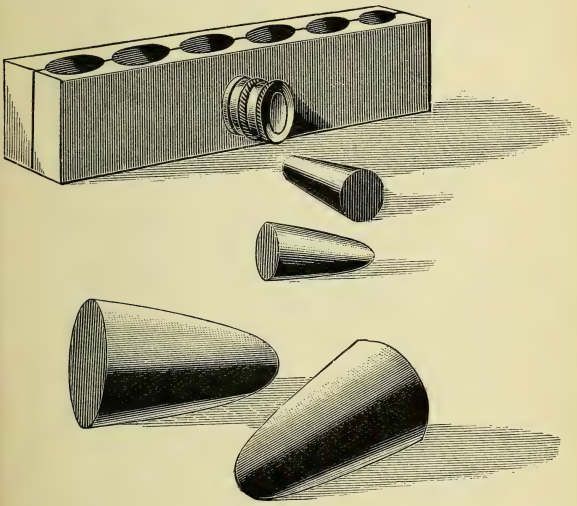


Fig. 14.

the simplest would be to wet the interior of the mould with water, but water will generally run off it in drops ; breathing into it often answers, or dusting over the surface with lycopodium and blowing out the excess ; but by far the best method is to smear over the interior with soap liniment. Spermaceti will be found a more satisfactory addition to the cacao butter than wax, as, owing to the rapidity of its congealing, the mass is not so liable to adhere ; oil applied to the interior of the moulds is liable to cause the suppositories to stick fast.

In the case of alkaloidal salts and watery extracts a more suitable basis than cacao butter will be found in the following Gelatin Basis :—1 oz. pure gelatin should be rapidly washed

in a little cold water and left to soak for about one hour in 3 ozs. water; glycerin 3 ozs. by weight is then added and the mixture thoroughly incorporated on a water bath till the weight is reduced to 5 ozs. The melted mass, after being skimmed, is then poured into a wide-mouthed stoppered bottle, and when cold covered with a layer of alcohol. The basis when required is melted with the alkaloid or extract in a small evaporating dish and poured into moulds previously greased with a little oil. The same plan may be employed in making the next class of preparation. Extract of Ergot, Cocaine, and Hazeline make elegant masses with such a basis. The relative proportions of glycerin, water, and gelatin may be varied to suit the amount of aqueous medicament. The official glycerin suppositories contain 70 per cent. glycerin.

Pessaries are made in precisely the same way, only they are from three to eight times larger (Fig. 14), generally weighing about one drachm, and made in larger moulds of a similar shape. If a very small pessary is ordered, it may be made as two suppositories fused at their bases, forming a double cone, and this shape answers well when it has to be moulded by the fingers.

Bougies are also made like suppositories, but they differ in shape, being long and thin (not conical) as is shown in Figure 15. They can be made in a mould, but great care has to be exercised, for, on account of the small bore of the mould, the melted mixture may become plugged in its transit down the canal, and thereby be spoilt. The material must consequently be more thoroughly liquefied before pouring into the mould than in the case of suppositories and pessaries, or the metal may be slightly warmed by immersion in warm water to prevent rapid congealing of the mixture whilst being poured down the narrow canal.

A mode of operation has been advocated as most successful in making bougies:—A long glass tube is obtained, having a bore the size of a bougie (about $\frac{3}{16}$th of an inch in diameter), and also a piece of glass rod of equal length which can just be passed through the tube. The tube is slightly warmed if necessary, and the melted mass is sucked up into it. When it has set completely it is carefully pushed out by means of the glass rod, and cut into the required number of bougies of equal lengths. One end can be moulded by the fingers to a blunt point.

Suppositories, pessaries, and bougies should be dispensed in cardboard boxes, with cotton wool; and the directions for their use should be plainly given by the physician, or written on the box by the dispenser, as sometimes in ignorance they are swallowed.

Should they contain any volatile ingredient, each ought to be wrapped either in tinfoil or in waxed paper.

Pessaries and suppositories, containing Green Extracts, may be readily made by first rubbing the extract with a few drops of warm water till of a creamy consistence, adding $\frac{1}{3}$ the oil of

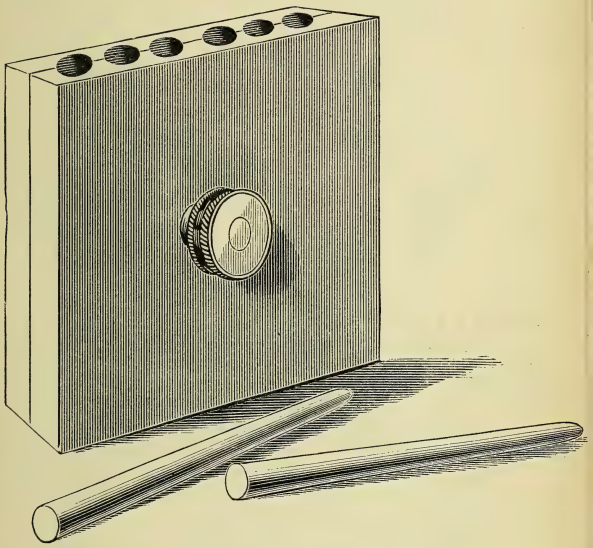


Fig. 15.

theobroma, rubbing again till smooth, and adding the mixture to the remaining $\frac{2}{3}$ of the oil heated; after thorough incorporation, and further heating if necessary, the mass may be poured into moulds.

CHAPTER IX.

DISPENSING OF BLISTERS AND PLASTERS.

BLISTERS are generally spread upon adhesive plaster. In the case of public charitable institutions, they may be spread upon brown paper; but, unless directed otherwise, they should always be put upon the adhesive plaster, which is itself spread upon thin

glazed calico, and sold in rolls of a yard each. The twilled calico, swansdown, and other fabrics, as a rule, are not so suitable. The dispenser takes the size of the required blister, which is commonly oval or square, and prepares a "shape" by

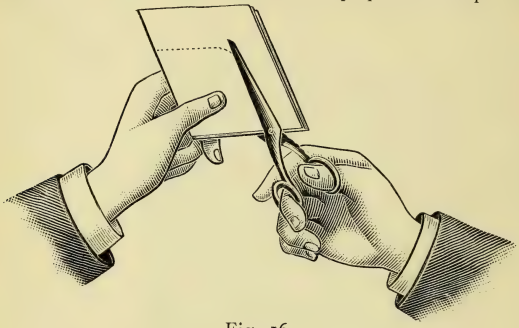


Fig. 16.

folding a square piece of waste writing or wrapping paper twice upon itself, and with a pair of scissors he cuts the form and size of the blister out of the middle of this, rejecting the cut out centre (Fig. 16).

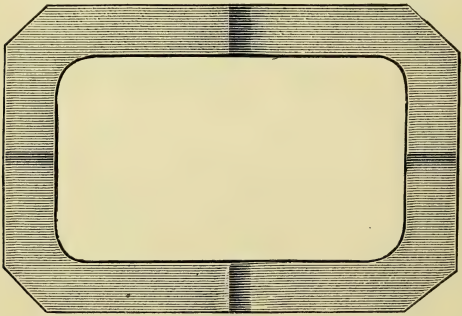


Fig. 17.

He has now an exact shape (Fig. 17), the inner margin or edge of which is the same size and form as the circumference of the required blister. (This is precisely the same manner in which plaster shapes are made.) A piece of the thin sheet of

adhesive plaster is cut about one inch larger than the blister, and may be gently warmed, only enough heat being used to make it *slightly* sticky ; it is then quickly laid upon some firm smooth surface, and the shape pressed upon the adhesive side—where it should evenly adhere, but only to such a degree that it readily separates when pulled off. All is now ready for the spreading process, which should be accomplished by the thumb alone. The cantharides plaster of the Pharmacopœia is well adapted for this. A piece about the size required is kneaded between the fingers until *uniformly* softened throughout, when the dispenser, steadying the shape and plaster with the fingers of the left hand, spreads a piece about the size of a bean with the side and front of the last joint of the right thumb, beginning at the corner next him, and continuing in a series of rainbow strokes till the plaster is covered (Fig. 18).

A long spatula, not unlike a dinner-knife, warmed so slightly that its temperature can be borne by the skin when

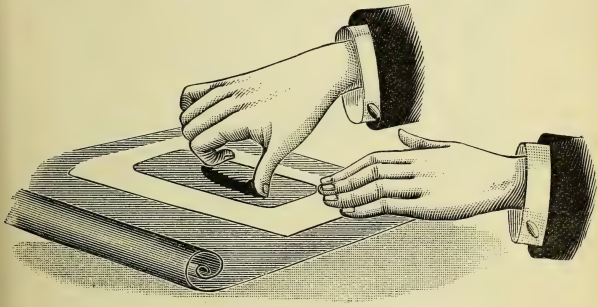


Fig. 18.

pressed against the cheek, should now be firmly passed over the blister, removing superfluous plaster, and making its surface smooth and even. Some dispensers previously sprinkle a few drops of blistering liquid, or olive oil, over it to improve its appearance, but this is not necessary. The paper shape is now peeled off the plaster, and the edges trimmed neatly with a *large* pair of scissors, allowing a margin of plaster about three-eighths of an inch wide to remain ; a piece of waxed or oiled paper is laid on its surface, and the whole enclosed in a paper box or envelope. The dispenser or physician should be careful to direct that this paper be removed before application, as blisters and plasters have sometimes been rejected as useless,

the paper never having been removed. Instead of cutting the piece of plaster for the blister off the roll, the experienced spreader may lay the shape on the roll itself, thus saving the clippings, as shown in the Figure.

Plasters are more difficult to spread, since they require heat, and they are often liable to be burned, creased, or uneven; and the dispenser who can spread a plaster properly will be always found to be one who can perform every other duty of the art of compounding satisfactorily; hence it may be looked upon as the test of pharmaceutical accomplishment to be able to perform this operation neatly and excellently. Plasters are generally spread upon sheep-skin or stiff chamois, and sometimes over adhesive plaster which has been already spread upon linen, dimity, or moleskin; but when the physician simply orders a plaster without specifying the fabric upon which it is to be spread, he means it to be dispensed on the white sheep-skin which is kept by every dispenser. The same steps are gone through exactly in cutting the shape as if for making a blister; a piece of leather somewhat larger than the size of the intended plaster is cut off the skin, and pulled in different directions gently, to make sure that it will not yield too much when the weight of the iron goes on it. The leather is next placed on some soft even surface; a few quires of wrapping-paper laid on the dispensing counter answer very well. The plaster iron, which should not be too large, is now *slightly* warmed over a gas stove or in the fire, wiped clean, and passed over the surface of the leather, so as to remove every wrinkle and inequality; the shape laid on the counter is moistened on one surface with a little damp tow or sponge. The addition of some soap to the water in which the sponge or tow is wetted is a practical point worth remembering, or a little flour paste may be employed. (Excellent results are obtained by dipping the shape into water.) It is now placed upon the *rough* side of the leather, and pressed carefully and evenly with the palm of the hand near the wrist, until it adheres at every point to the leather, when all is ready for spreading.

Some dispensers, especially those who have not much experience in plaster spreading, fasten the skin to a piece of board by means of a small tack at each corner so as to keep it thoroughly stretched, but yet capable of being moved about into any position during the spreading process.

The different plasters are kept in cylindrical rolls, and are melted as required, by means of the plaster iron, on the heating of which the success of the operation depends; it should be warm enough to readily melt the plaster, without spoiling the leather; its heat may be judged by pressing it against a clipping from the sheep-skin, which will brown and curl up if too hot.

When the plaster iron is over-heated, a film forms on its surface, and often small particles of carbon adhere to it, which, coming off during the spreading, spoil the appearance of the plaster. To guard against this, the iron, after coming out of the fire, should be briskly rubbed against some soft solid substance, as a piece of wood or coarse cloth. Irons are now made which can be heated by allowing gas jets to burn in their interior, and thus there is no limit to the amount of work which one iron can accomplish without interrupting the operation.

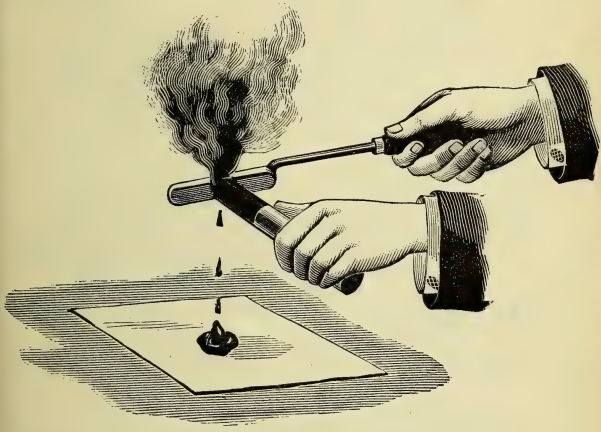


Fig. 19.

The iron then being heated to the right degree, its flat face is pressed with a slight circular movement against the end of the roll of plaster, and the liquid plaster which drops down is caught upon a piece of strong, smooth brown paper, as shown in Figure 19. If two or more varieties of plaster are ordered in combination, it is at this stage that they are melted together against the *face* of the iron, and mixed with its sharp *edge* on the paper; and, when a thoroughly uniform creamy mass is obtained, it is scraped along the surface of the paper to near its margin. The leather, with the shape attached, is now brought alongside, when a few strokes with the near edge and adjoining part of the face of the iron will spread the plaster over the surface of the leather, beginning at the edge next the

operator, and sweeping round the far margin in a series of half ovals, watching the borders and corners, "for the centre will take care of itself." (Fig. 20.) Towards the end, when the leather is covered, the flat face of the iron may be used to smooth all irregularities, and, after a moment's delay, during which the plaster hardens, the shape may be pulled off, and the borders of the leather trimmed; in a medium-sized plaster at least three-quarters of an inch of border should be left. One iron will not do all this; and before beginning, two should be selected; the second may come into use about the time the

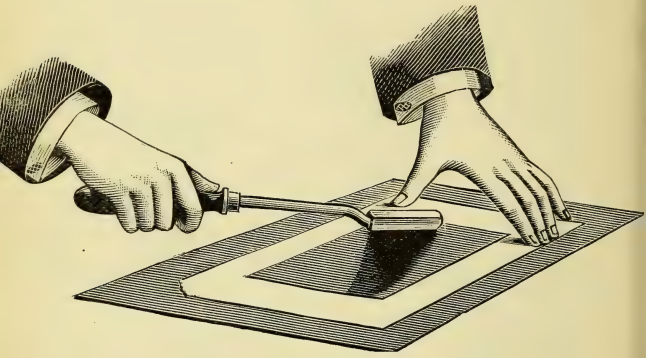


Fig. 20.

plaster is being transferred from the paper to the leather. If the plaster were melted directly on to the leather, as some advise, a mess would probably be the result.

Especially when a mixture of plasters is to be spread, one sometimes sees a ladle brought into requisition in which to melt and mix the ingredients, and from which it is poured on to the leather. The iron in such a case does not come into requisition until required for spreading.

Sometimes a plaster with an *adhesive* margin is ordered to be spread on leather, and it is a more troublesome process than the above. It may be done in this way:—The shape is cut as described, and the centre piece, instead of being thrown aside, is damped, and pressed against the middle of the leather; the shape is taken, folded up again, and a piece cut out of it for the entire extent of its inner margin—thus enlarging it by the

width of the intended adhesive margin; it is then stuck to the leather, leaving a space between its inner margin and the central piece of paper, which space is to be spread over with adhesive plaster, both papers pulled off, and the vacant central part covered over with the plaster as ordered, the edge trimmed, the surface loosely covered with a piece of waxed paper, and dispensed in a flat paper box. The dispenser, until he has acquired great practice at spreading plasters, will be unable to finish the inside space without a shape; and he may achieve all that is required in this way:—The leather to be covered with plaster is laid down flat as before, and, with one good circular sweep of a large iron, its circumference is surrounded with a margin of adhesive or resin plaster; when this is cold, the shape, cut as before to the exact size of the plaster required, is laid down on the leather and attached, by means of a little soft soap, to the adhesive marginal surface. The plaster, having been mixed as previously directed on a separate bit of paper, is rapidly spread, as if there were no adhesive margin in the case, the shape is now torn off and the adhesive border trimmed. The student will observe that if these directions are followed he will have no plain margin outside the adhesive one, and seldom is such deemed necessary, so that this latter method is, on the whole, the better one for him to learn.

CHAPTER X.

CACHET MAKING.

A MORE recent method of administering remedies than any of the foregoing is the form of Cachets, in which drugs are given in a powdered state, enclosed in a thin wafer paper cell. These are made of different sizes, which will hold from a grain, or less, to 20 or 25 grains. For the administration of nauseous or bitter substances, such as quinine, it is a very effective plan, and commends itself highly to physicians. The cachet machine, as figured, is made up of several pieces. The body of the machine is composed of three plates on hinges *(a, b,* and *c)*, which, with the funnel *(d)*, thimble *(e)*, and felt roller *(f)* for moistening the rims of the cachets, complete the apparatus. There are six sizes of cachets, which vary in depth and diameter, three different diameters being employed.

To describe cachet making, we will suppose a dozen containing 5 grains of quinine in each are ordered. The size numbered $0\frac{1}{2}$ is most suitable, and 2 dozen of the

"cachet-leaves" are taken, half being put into holes in plate *c*, and the others into the corresponding *depressions* in plate *a*, the middle plate. Plate *b* is now hinged over to cover plate *a*. The funnel in being placed in position rests on the edge of the hole in plate *b* so as to avoid pressing upon the cachet, and also to allow sufficient elevation of the powder when pressed in to fill the upper "cachet-leaf," when it is ultimately brought to cover it. Five grains of quinine are weighed, powdered, and placed in the funnel, and with the

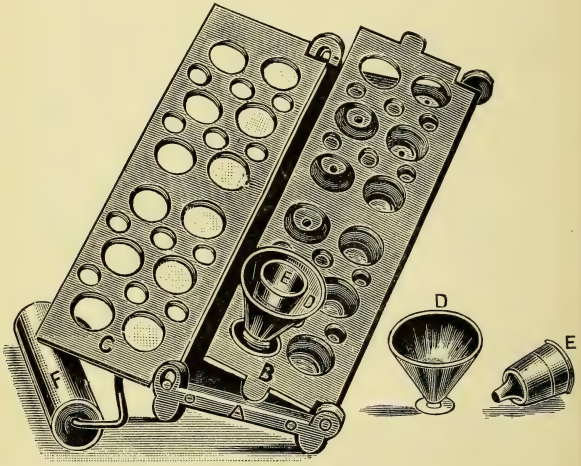


Fig. 21.

thimble *(e)* upon the index finger the drug is pressed lightly downwards into the "cachet-leaf." The end of the thimble is concave, so that the surface of the contents is convex. This process is repeated until the dozen are finished. Plate *b* is now hinged off, and the filled half cachets or "cachet-leaves" are ready to receive the others to complete the process. This next step is the one which requires most skill, for the application of moisture to the rims is important. Neither too much nor too little should be applied. If too much, the rims are likely to be damaged; if too little, they gape. To moisten the rims the roller *(f)* is damped by passing it over wet spongio-piline, and then it is rolled over the

rims of the half cachets in plate *c*, which is then hinged over and pressed upon plate *a*. The finished cachets are gently removed from the circles in plate *c*, and are dispensed in boxes.



Fig. 22.

Cachets can be obtained having much the shape of a spoon with a broad, short handle. When the drug is placed in the bowl of the "spoon," the handle is bent over and encloses it.

Fig. 22 shows a cachet-leaf and two finished cachets.

CHAPTER XI.

GENERAL HINTS TO THE DISPENSER.

In our limited space we can only give a very few additional hints to the student of pharmacy upon such matters as do not naturally fall under the previous chapters. It is hardly necessary here to remind him that upon his simplest manipulations hangs the life of the patient, and though this solemn sense of his responsibility should be ever before his mind, it should not be allowed to paralyse his exertions, or tend to render him "unpractical." Over-confidence is a fruitful source of mistakes in pharmacy, as it is in other departments, and the pharmacist must be cautioned against falling into the habit of working mechanically or automatically, so common amongst the absent-minded. It is a frequent occurrence, for example, to see a dispenser walk in an automatic way up to a well remembered place where a bottle has always stood, lift it from its shelf, and pour out its contents without looking at the label. If the student should find himself falling into this habit, his remedy is to occasionally remove the bottles and occupy their places with others unmistakeably different in shape and size.

Artificial Waters should not be employed, as they are wanting in the fragrance of the distilled preparations.

Solutions.—As quickness and despatch are generally considerations in pharmacy, it is advisable to keep some of the more frequently prescribed salts in solution ; and a few hints as to the most convenient strengths of these solutions may not be out of place here.

Alum, $2\frac{1}{2}$ ozs. (Troy) dissolve in 1 quart of distilled water; each ounce of the solution representing half a drachm of the salt.

Potassium Bicarbonate, 1 ounce (Troy), dissolved in enough distilled water to measure 4 ounces, makes a very suitable stock solution, as half an ounce of it contains one drachm or 60 grs. of the salt.

Potassium Chlorate, 1 in 24, made in the same way, is the best strength to suit all variations of temperature. The salt is soluble in a smaller quantity of water, but is apt to crystallise with changes of temperature.

Epsom Salt, 1 in 2; **Potassium Bromide,** 1 in 3; and **Chloral Hydrate,** 1 in 1, make very convenient solutions, the latter particularly so; each minim represents one grain of chloral, and it is fairly stable and easily calculated.

Official Pill Masses.—Some of the official pill masses become very hard on keeping, and get so brittle as to be unmanageable; they may, with great advantage, be kept in the dry state, the powdered ingredients being mixed together, so that the menstruum ordered in the Pharmacopœia to give consistence may be added at the time of dispensing. In this way Pil. Colocynth. Co., Pil. Aloes Barb., and Socot., Pil. Aloes et Ferri, and Pil. Hyd. Subchlor. Co. may be kept with the required proportions of the requisite menstruum marked on the bottles in which they are contained. This plan is often a great help if the physician happens to order too soft a mass.

Syrup. Ferri Iodidi for dispensing may be kept in the form of the liquor without decomposition or discolouration if a minute quantity of hypophosphorous acid be present to prevent oxidation. It can be made exactly to correspond with the official syrup by adding the requisite amount of sugar.

Mistura Ferri Co. can also be kept in a concentrated form, so that every drachm will contain the constituents of an ounce of the mixture, except the ferrous sulphate, which is to be weighed out and added with the remainder of the vehicle the last thing before dispensing.

Mistura Ammoniaci may be kept in concentrated form so that 1 drachm of the liquid will represent 1 oz. of the official mixture.

Mist. Cretæ can be easily kept in powder, ready for the addition of cinnamon water.

Concentrated Infusions and Decoctions, so often employed by pharmacists for convenience, are to be condemned. *These preparations should always be made fresh as required.* The

new departure of encumbering the B.P. with these costly preparations is to be deplored.

Substitution.—It cannot be too strongly impressed upon the student's mind that substitution should never be practised. By substitution is meant the using of an equivalent quantity of one preparation of a drug for that of another ; say for instance, infusion of cinchona is required, it would be absolutely wrong to use an equivalent quantity of the liquid extract, as it is more than probable that this latter preparation does not contain the full quantity of alkaloids that an equivalent quantity of bark in the infusion does. The student of pharmacy never should depart from the strict observance of the Pharmacopœia.

Unofficial Nomenclature.—Often the dispenser will be at a loss to understand the meaning of the prescriber, when he orders some preparations out of their official names, and he then must have a consultation, or fall back upon the experience of himself or others. A few examples may be given :—When Magnes. Calc. is ordered, Magnesia Ponderosa B.P. should be used ; when Magnes. Carb., the *heavy* preparation is usually intended ; when Bismuth., or Bismuth. Alb., is prescribed, the subnitrate is the preparation generally in the mind of the physician ; when Æther. Chlor. is ordered, it is best not to dispense "chloric ether," but Spirit of Chloroform B.P.

Liq. Morphiæ is very often written in a prescription, and the dispenser will do well to employ Liq. Morph. Hydrochlor. When Extract. Aloes is written, the rule was to use the Socotrine, but now that the Pharmacopœia recognises only Extract of Barbados Aloes it should be dispensed.

Much confusion unfortunately exists in the memory of some prescribers about the mercurial chlorides, and fatal consequences have resulted. The Subchloride is often written Hyd. Chlor., Hyd. Mur., Hyd. Submur., and the Perchloride is occasionally prescribed as Hyd. Chlor., or Hyd. Bichlor.

If the dispenser find it impossible to consult the physician in such cases, he will not regret giving the Subchloride, if more than $\frac{1}{5}$ grain is ordered in each dose.

It will be well to remember that Hydrate of Chloral is sometimes carelessly written Hyd. Chlor.

Loose or Dry Ingredients.— Roots, crystalline salts, leaves or seeds, when prescribed in the crude state by the physician, should be cut, chopped or bruised so as to alter their physical characters and prevent their being easily recognised by the patient.

Incompatibility.—When the pharmacist gets a prescription where incompatible substances are ordered it is clearly his duty to compound it, unless *absolutely* incompatible, in which

case the different ingredients will not mix, and, if possible, then he should consult the prescriber. Instances of such might be given to fill a large volume, and, unfortunately, no rule can be laid down for the guidance of the young dispenser, as it is still an open question with pharmaceutical authorities whether a compounder is justified in altering a prescription, suppose he find the emulsifier or pill excipient ordered by a medical man unsuitable. Much will depend upon his knowledge of the prescriber; if he is satisfied that the incompatibility was known to him, it is clearly his best rule to follow the written law of the prescription, and carry out rigidly the intention of the prescriber. But if upon the other hand, the chemical action (inevitable upon the mixing of the ingredients) was *evidently unintentional*, the dispenser will be justified in averting it by any means at his disposal. If the incompatibility produces such a change in the ingredients of the prescription as would probably risk the life of the patient, the dispenser should not compound it without a consultation. An example of such incompatibility may be instanced in the case of compounding chlorate of potassium with syrup of iodide of iron, the free iodine and chlorine liberated having proved fatal when the mixture was administered.

Iodide of potassium is easily decomposed by nitric and most other acids, which after a time liberate free iodine, which, falling as a sediment, may be taken in such a dose as would prove fatal.

It is not an unusual mistake to order in tertiary syphilis large doses of iodide of potassium along with full doses of tincture of perchloride of iron; free iodine is precipitated, and in a concentrated mixture of this kind has caused death. A very dangerous combination has been occasionally prescribed when free iodine or a strong solution has been ordered with solution of ammonia or compound camphor liniment; the precipitated iodide of nitrogen is a most dangerous explosive. Reference has already been made to the explosive nature of pills containing oxide of silver and creosote; they have taken fire and caused serious injury to the patient. Fatal results have been reported in several instances where alkalies have been ordered in mixtures containing strychnine, as this alkaloid is precipitated by alkalies, and the last few doses containing the greater part of the insoluble strychnine have been swallowed and have killed the patient. Strychnine is also thrown down by bromide of potassium, and the insoluble bromide has in the same way caused death.

Looking at the question from the physician's point of view, the writer thoroughly endorses Mr. Ince's opinion:—"We have no right to expose a patient to the risk of imperfect combination,

and here as a dispenser, I would act upon my own responsibility. The interest of the physician is best served by the dispenser who is a sentient being, and not an automaton."

Poisonous Doses, or doses which may strike the dispenser as decidedly risky to the patient's life, should not be dispensed unless the dispenser happens to have some evidence that such is within the prescriber's knowledge. If, for instance, the poisonous dose was *underlined*, *initialled*, &c., or as it is usual in Germany, followed by a note of exclamation, the dispenser can, without hesitation, send it to the patient.

We may conclude these necessarily brief suggestions on Extemporaneous Pharmacy by quoting the following guiding rules for the pharmaceutical student from the *Chemist and Druggist's Diary*, 1885. They epitomise the principles laid down in the foregoing chapters :—

"1. Read through a prescription rapidly, and in a manner suggesting no suspicion of doubt. 2. Write directions invariably before dispensing. 3. Avoid thus the use of blotting paper. A good dispenser uses almost none. 4. If a mixture contains readily soluble ingredients, never use a mortar. Avoid effecting solution by heat, for fear of recrystallisation. 5. With syrups, and also ingredients not water, arrange in dispensing to rinse out the measure and leave it clean. A skilled dispenser shows very little traces of his work. 6. Carefully clean and put away weights and scales after each operation. 7. Hold the scales firmly by the left hand, never lift them high above the counter, and judge of the weight as much by the indicator as by the position of the scale. 8. Select glass pans for scales, preferably of heavy make, and discard flimsy brass material, which corrodes speedily and becomes inaccurate. 9. Learn to judge of the quantity to be weighed with tolerable accuracy ; train the eye as well as hand. 10. If in doubt, always begin with that in which you have no doubt. 11. Be rapid in manipulation. Finish wrapping, tying, or sealing quickly. Slow dispensing is bad dispensing, and arises either from deficient practice or want of knowledge. 12. Never, when in a shadow of a doubt, hesitate to ask advice from a fear of compromising your own dignity."

CHAPTER XII.

OFFICIAL PHARMACY AND THE PHARMACOPŒIA.

THE *British Pharmacopœia* is published under the supervision of the Medical Council, and undergoes revision at irregular intervals. It may be regarded by the pharmacist as having all the authority of an act of Parliament. The drugs, tests, and processes mentioned in it are said to be "Official" or "Officinal." The following pages will briefly describe the chief pharmaceutical processes referred to in it. The student will probably discover that many of these are but repetitions of processes already practised by him in the chemical laboratory—as precipitation, crystallisation, &c.; others, however, will be found to be peculiar to pharmacy—as percolation, infusion, &c.; and it will be advisable for him, before entering upon the study of the various preparations, to glance at a few of these more important processes—especially to those that are common to many groups of preparations, as—

Affusion or Ablution—by which is meant the pouring of water on any substance to cleanse it of its impurities. In the washing of a precipitate, for example, the student is directed to pour cold or hot water upon it, shake or stir briskly, allow the insoluble part to fall to the bottom by rest, and then to pour or draw off the supernatant liquid. In the *British Pharmacopœia* these simple operations are respectively dignified by the names of

Affusion, *Agitation*, *Subsidence or Deposition*, *and Decantation.*

Analysis—In the Pharmacopœia both the *qualitative* and *quantitative* methods are frequently directed to be employed ; and of the latter sometimes the *volumetric* and sometimes the *gravimetric* process is made use of.—(See "Testing.")

Baths—Sand, water, and steam are mentioned under "Fusion."

Boiling or **Decoction** is largely employed in the manufacture of various decoctions, extracts, syrups, &c. Generally the directions are, that the article to be decocted is to be put into a covered vessel with cold water, and allowed to boil on the fire for a given time. If a larger quantity of water, with the substance in it, is to be boiled down to a smaller quantity, then the decoction is a mixed method of boiling and concentrating by evaporation, and an uncovered vessel is selected ; decoction of pomegranate is made in this way. The process of making extracts is quite different ; here the evaporation or boiling is performed after the drug is separated from the original decoction,

juice, or infusion. **Ebullition** is the ordinary chemical term for boiling, and is occasioned by the formation of bubbles of vapour within the liquid, which rise to the surface like gas bubbles. Decoction, strictly speaking, is the ebullition of a liquid, containing some vegetable substance whose virtues are to be extracted by the boiling liquid.

Bruising or **Contusion** is a process by which soft, elastic, or ligneous substances have their structure broken up before being subjected to the action of a solvent by infusion or maceration. It is employed to break down the cohesion of fibrous roots, and is applicable to all tough drugs, like ergot, cloves, asafetida, &c., and to fresh leaves and young juicy branches. The article to be bruised is put into an iron or strong stone mortar, and, with a straight up-and-down movement of the pestle, it is bruised, crushed, or pounded till the requisite degree of destruction of tissue is obtained, a little only being operated on at a time. The same object is often attained by cutting.

Calcination or **Incineration** is the process of exposing a substance to a high heat, so that water and volatile matters are driven off, or oxygen absorbed, and the residue left in a finely-divided powdery condition. The process is carried on by placing the substance to be calcined in a Cornish, Hessian, or other crucible, which is placed in a furnace. In this manner the Pharmacopœia directs magnesia and lime to be prepared from their carbonates.

Clarification or **Depuration** is the purification of a substance, generally a liquid or semi-solid, by extracting its impurities, as in the case of honey, lard, suet, &c., by melting or heating, and, whilst fluid, straining through some texture like flannel. It is a modification of the process of filtration.

Crystallisation is the process which bodies undergo in passing from the liquid or gaseous state to assume definite and regular geometrical forms, called crystals. This process is generally directed to be carried out by the cooling or evaporation of a solution containing the substance to be crystallised, or more rarely it is ordered to be effected by fusion, as in the case of some metals and sulphur ; by sublimation, as benzoic acid and corrosive sublimate ; or by precipitation, as in the instance of the red iodide of mercury. In obtaining crystals by evaporation the liquid is either boiled till its volume is reduced by the loss of vapour, or it may be kept at a lower temperature than the boiling point for a longer time till the same effect is produced, and when the concentration has proceeded so far that a scum or pellicle forms on its surface, the liquid is set aside to cool, and as the temperature falls crystals form. When they have ceased to grow or increase, the fluid part, which is now called the

"mother liquor," is poured off, and the crystals drained and dried. A second or third crop may be obtained from the mother liquor by further evaporation and cooling, as in the first instance. The process is hastened by the presence of foreign bodies, as threads or sticks, round which the crystals quickly gather; or by agitation, when the crystals will be found to be small. The slower the process the larger and more regular will be the crystals, and it is advisable not to evaporate just so far as the Pharmacopœia directs usually for most of its salts. The six systems of crystals are all well represented in the B.P.

In the case of some salts like alum, carbonate of sodium, and sulphate of iron, the water of crystallisation, which the salt carries down with it on assuming the solid form, is directed to be expelled by heat, thus increasing the strength of the substance by the weight of the water lost, which ranges generally from $\frac{1}{4}$ to $\frac{3}{4}$ of the original salt; thus dried sulphate of iron is nearly twice the strength of the crystals.

Decoloration — a process by which substances like the alkaloids Morphine, Atropine, &c., are deprived of colour—consists in treating a solution or mixture of the substance with powdered charcoal and filtering. Purified animal charcoal is directed to be used.

Despumation is the name given to the process by which many organic liquids are purified by the application of heat, when the impurity rises to the top as a scum, and is easily removed by skimming or by filtration. Though not directly mentioned under this name in the Pharmacopœia, this process is extensively employed, as in the making of the green extracts, and the practical pharmacist finds that the syrups made with organic liquids, like the majority of the official ones, keep much longer by being despumated. This is the more necessary as it is difficult to find sugar perfectly pure and free from organic adulteration.

Desiccation is the name given to the process of drying drugs.—(See under "Drying.")

Dialysis is the process by which crystalloids are separated from colloids by passing the liquid containing them through an animal membrane like parchment. The dialyser is floated upon the surface of water and the crystalloids pass through as in the preparation of solution of dialysed iron, which is now non-official.

Digestion is one of several allied processes often confounded. It means the prolonged treatment, at a heat elevated, but below the boiling point, of a substance (such as a powdered root) in the liquid intended to dissolve out its soluble principles. It is

the same as maceration at a higher temperature than that of the air.

Distillation is the process by which a liquid is converted into a vapour on the application of heat, and the vapour is condensed into a liquid again in a separate vessel. The variety of apparatus for the process is endless. The simplest would consist of a closed vessel called a retort, from the top of which a long tube leads to a receiver. On partially filling such a vessel with volatile liquid, and applying heat till boiling, the vapour of the liquid would fill the upper part of the vessel and tube, during its passage through which it would be cooled or condensed, and drop into the cold receiver as a liquid. The object of distillation is to combine volatile substances which cannot otherwise be mixed, as in the preparation of the waters, or to separate mixed volatile and fixed substances, as in making Spt. Ammon. Fetid., or to separate impurities from the liquid which could not be got rid of otherwise. Distillation is a mixed process, consisting of ebullition—by which, in the first instance, the volatile substance is converted into vapour—and of condensation, by which the vapour is again changed into a liquid.

Destructive or **Dry Distillation** is the process by which a body is decomposed by heat into volatile products which did not previously exist in it, the products being collected in a separate vessel, as in the production of acetic acid and tar from wood.

Fractional Distillation means the distilling of a mixture of substances volatile at different temperatures, whereby they may be separated and received into different vessels by regulating the temperature.

Drying is a process used in the preparation of a great many remedies. There are, however, no official directions given for the drying of roots, leaves, seeds, &c.; these are generally submitted to a uniform temperature, after being spread out on shallow trays or drawers of network, in a room, heated by steam or hot water pipes. The best heat is one ranging between 100° and 130° F. Many plants which are used in pharmacy are dried simply by exposure to the sunshine of their native country, but this is not practicable in our latitude. Flowers should be allowed to dry spontaneously. Fleshy roots should be transversely sliced before being placed in the drying room. Crystals and precipitates, as a rule, stand higher temperatures, and may be dried on a water bath. Others require still higher temperatures, especially when we aim at the expulsion of the water of crystallisation, as in drying alum and sulphate of iron—where a heat of nearly 400° is required. On the other hand, some salts, like the valerianate of zinc, must be dried at the

ordinary heat of the surrounding atmosphere. Carbonate of potassium and slaked lime recently heated are used to absorb the water from alcohol, freshly burned lime from ether, whilst sulphuric acid is used in various drying processes.

Elutriation—The process of powdering rough insoluble substances like chalk, ores, &c., and mixing them with water, so that the finer, light, powdery portion may be poured off after the coarser particles have fallen to the bottom. It is done sometimes merely to wash away such impurities as sand, gravel, &c. ; in its results it resembles sifting.

Expression is the process by which the juice or oil is squeezed out from vegetable substances, and the tincture or spirit from the marc after maceration or percolation. It is performed by putting the substance into a suitable press, and by mechanical power separating the solid from the liquid portions. Oils so obtained are called expressed or fixed oils, to distinguish them from volatile or distilled oils.

Evaporation is the process by which the volume of a liquid is reduced and its volatile constituents driven off by a heat ranging between that of the air and the boiling point of the liquid. It is employed in the making of extracts, in the crystallisation of salts, and many other operations in pharmacy. The vessels used should be very shallow, and present a large surface of the liquid exposed to the air. In evaporating vegetable juices and infusions, a moderate heat should be employed—say about 140° F. The nearer the liquid is kept to the boiling point the quicker the evaporation ; and small quantities only of vegetable infusions or juices should be subjected to the process, and in separate batches, which can be evaporated down still further if necessary, thus preventing deterioration by long heating. Stirring quickens the process, and the heat may be regulated by the use of a water, steam, or sand bath.—(For which see "Fusion.")

Filtration is a process by which we separate an insoluble matter or sediment from a liquid, by causing it to flow through the pores of blotting paper, flannel, felt, calico, or linen, the liquid after passing through being clear and bright. *Straining* is a quicker, but rougher, process of the same nature, for the removal generally of *visible* foreign particles, by causing the liquid containing them to pass through the open meshes of muslin, tow, wool, asbestos, or wire netting. If a liquid is *perfectly* transparent, and offers no obstacle to the passage of light, it is said to be "bright," though it may be highly coloured. All tinctures should possess this quality ; and if they do not, repeated filtration and rest will brighten them. In the case of very dark liquids, they should also be bright when

examined in *minute* quantity by transmitted light. Opposed to this condition we have that of "muddiness," which is often an opprobrium to the pharmacist; it is caused by the presence of *invisible* particles in a state of suspension, producing translucency. A mixture or liquid is said to be "clear" when no *visible* particles of foreign matter are detected in it; hence a liquid may be bright, but not clear, if it contain a few coarse particles floating through it and is otherwise transparent. The treatment for muddiness or opalescence is Filtration; to produce clearness, *Straining* is the remedy.

Fusion, Liquefaction or **Melting,** is the process by which solid bodies are rendered liquid by the application of heat; it is largely employed in making ointments, plasters, caustic sticks, and in purifying resins, and for the purpose of decomposition—as in making Potassii Permang. The substances are put into a suitable vessel and heat applied, varying from a temperature of 90°, sufficient to melt lard in an open jar, to one of 800° for fusing zinc in an earthen crucible. The water, steam, and sand baths are frequently employed. The *water bath* consists of an apparatus by means of which water, or its vapour, at a temperature not exceeding 212°, is applied to the outer surface of a vessel containing the substance to be heated. In the *steam bath*, the vapour of water at a temperature above 212°, but not exceeding 230°, is similarly applied; and in the *sand bath*, a vessel partially filled with fine sand is placed upon the top of a stove or on the open fire, and the substance to be heated in a jar or crucible is thrust down into the sand; it differs from the steam or water bath in not limiting the degree of heat, and is no safeguard against any high temperature being reached; but it effectually prevents sudden changes in the heat, keeping the substance at a uniform degree. Since alkalies and oxide of lead attack silicious substances, for them iron or silver crucibles must be used. Platinum also is attacked by alkalies, though very feebly.

Gathering of Plants, &c., should be effected, when possible, in sunny weather, and at the time specified in any particular case in the Pharmacopœia. Generally, roots of annual plants should be dug up *before* flowering; and perennial roots should be gathered in winter or very early spring, as soon as the first leaves show themselves above ground, and not till plants are two or three years old at least. Rhubarb should be six years of age. Leaves should be gathered before they begin to change colour, and those of biennial plants not till the second year—as hyoscyamus for example, collected in the first year of its life, is almost inert; some are directed to be gathered when the plant has two-thirds of its flowers expanded, others when the fruit begins to form.

Barks should be collected when they come off most readily from the wood—*i.e.*, from trees in the spring and from shrubs in

the autumn. Flowers should be gathered when about four-fifths expanded ; the red rose, however, is collected in bud, otherwise it loses its astringency and colour ; and the flower-buds of the clove become almost devoid of aroma if allowed to expand. Fruits and seeds, generally, are collected when ripe ; but the pimento, pepper, and others, are exceptions.

Granulation is the process by which a coarsely crystalline salt is reduced to the condition of a granular powder, by dissolving it in water and evaporating the solution—incessantly stirring till the product becomes dry. Carbonate and citrate of potassium are thus made, and sometimes substances which can scarcely be reduced to powder otherwise are treated in this way, such as sal ammoniac and nitre.

Infusion is the process of extracting from a body, commonly of vegetable origin, its virtues or soluble parts, by treating it for a short time with water in a covered vessel, the substance being first reduced to a state of moderate subdivision or coarse powder ; generally water in the act of boiling is used. Cold water is used to extract the virtues of calumba, in order to avoid dissolving the starch contained in it. As a rule the subdivision of the substance need not be carried to the same extent as for tinctures.

Levigation is the name given to a process like "Elutriation," in which an insoluble substance is *ground* into powder in presence of water or some liquid in which it is insoluble, the finer parts washed away and collected, the coarser being returned for further grinding with water, and so on till a fine powder is obtained. Red precipitate may be thus reduced. Elutriation is applicable to cheap, coarse materials like chalk and ores, where the refuse is not ground, but rejected.

Lixiviation is the process of acting upon a compound or mixed solid, with water, in order to dissolve out a soluble salt, the solution being poured off the insoluble residue and evaporated, as is done in the preparation of pearl-ash from wood-ashes.

Maceration is the process of steeping or soaking at the ordinary temperature of the atmosphere a substance in a liquid capable of dissolving some of its soluble constituents. The liquid is called the *menstruum*, and the rejected matter, which is insoluble, is spoken of as the *marc*. Several tinctures are directed to be prepared in this way. It differs from digestion in being carried on generally for a much longer time, and without heat, and alcohol is commonly the menstruum. The drug should be previously reduced to a proper state of comminution by bruising, cutting, or powdering.

Percolation or **Displacement** is one of the most important processes in pharmacy, being extensively used in the preparation of tinctures. It consists in packing into a short, wide tube,

closed at one end by tying a piece of calico over it, the substance, in a state of coarse powder, whose virtues are desired to be extracted, and pouring into the tube the menstruum—generally alcohol. As the spirit filters its way through the column of powder it dissolves out the soluble parts, and drops finally into the receiver below as a bright tincture. The process may thus be defined to be the "filtration of a liquid through a porous column of a powdered material, so that it may extract its soluble matter." It is not adapted to gummy or adhesive substances, but possesses the great advantages over maceration in being quicker, and in the fact that after the fluid has ceased to drop, the tincture still left in the tube can be displaced by pouring in more spirit or water on the top of the marc. The mixed form of first macerating and then percolating, which is frequently directed for the manufacture of tinctures, is decidedly better than either process used separately. At the bottom of the tube, immediately over the calico, a layer of fine pebbles or coarse river sand prevents the powder closing its pores (Fig. 23).

Great skill is required in carrying out the process of percolation, and much depends upon the degree of comminution which the substance receives. If the powder be too fine, it gets into a cake, and prevents the passage of the spirit; and, if too coarse, the spirit runs between the particles without dissolving out their active properties, flowing into little channels through the tube into the receiver. The B.P. now states the degree of fineness requisite for several vegetable tinctures, by ordering the powder to be passed through sieves of definite make. A good deal also depends upon the way in which the powder is packed into the tube, and experience only will give an idea of the uniform tightness and pressure required to be used. A heavy, round ebony ruler makes a good ram for packing in the powder.

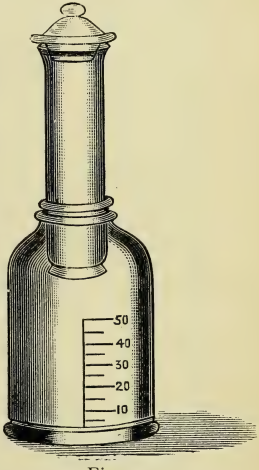


Fig. 23.

Pulverisation is the process of reducing solids to powder. The barks, roots, leaves, stems, and fruits of trees and vegetables are first thoroughly dried, and afterwards ground in a mill, of which there are many kinds. Leaves lose as much as 80 per cent. of their weight by drying and powdering, the powder often

gaining greatly in strength over the fresh leaves. Substances are reduced to the coarse powdered state necessary for infusion and percolation just as they are required, by bruising in an iron mortar, operating only on small quantities at once, and then passing the particles through sieves whose meshes are formed of parallel wires arranged with varying degrees of closeness, the powder which passes through being designated according to the number of parallel wires within a linear inch of the sieve surface. Salts and crystals may be reduced to powder in small quantities in a wedgewood mortar, by grinding or trituration, and sifting through muslin or fine metallic netting, the portion not going through the sieve being returned to the mortar, and the operation being repeated till the requisite fineness is obtained. Camphor can only be powdered by adding about the fourth of its weight of alcohol, and triturating it to dryness. Spermaceti, in like manner, by adding a little alcohol, may be easily reduced to powder, and tragacanth is best powdered warm. Some substances must be powdered and rubbed with water—"Levigation"—others by granulation, as zinc and tin; and iron, by filing or reducing with hydrogen. The powder differs from the vegetable drug of the same name, by having less water, essential oil, or volatile constituents, less woody fibre, and in being generally more active—powdered opium being one-eighth part at least more active than the fresh drug. The use of the mortar and pestle is fully described under "Mixing" and "Pill Making."

Precipitation in pharmacy, as in the laboratory, is the process by which we get a substance deposited from a solution, either by adding a second liquid in which it is insoluble, as in pouring water into spirit of camphor; or by mixing two solutions of different salts which combine and form an insoluble compound, as in mixing solutions of perchloride of mercury and iodide of potassium together, the iodide of mercury being thrown down as an insoluble crystalline powder, which is afterwards to be washed by the process of "Affusion."

Sifting is the process of separating the coarser from the finer particles of pulverised substances, and is generally performed by passing them through the meshes of fine wire, horse-hair, or muslin sieves. When fruits, like prunes, tamarinds, or figs, are ordered to be sifted, the operation is called "Pulping;" here considerable force must be employed to press the finer particles through, which, in the case of dried powders, are allowed to drop through by their own weight.

Solution.—The condition of a substance dissolved in a liquid is a state difficult to define. Most of the instances of solution in pharmacy are *simple*, as the solution of sugar in syrup, in which case the sugar is found unaltered on evaporation; in others, as in the saccharated solution of lime, the substance is in a state

of *chemical* solution, and cannot be recovered unaltered on evaporating. Others again are more difficult still to define, as the solution of one liquid in another, or of a gas in a liquid. The process of solution, with very few exceptions, is quickened by heating the solvent, and having the substance to be dissolved in fine division. Both these advantages are gained by the ordinary method of rubbing the substance in a mortar, with hot water. When the hot solvent ceases to dissolve any more of the substance, the solution is said to be saturated, and, on cooling, will always deposit some of the salt in crystals, the liquid, when cold, being called a cold saturated solution.

Standardization is the name given to the process by which certain preparations, as the extract of nux vomica and cherry-laurel water, are made to contain a definite and uniform amount of the alkaloidal or active principle of the vegetable drug from which they are extracted.

Sublimation is the process by which a solid is reduced by heat to the state of a vapour, which is condensed and deposited on the surface of another vessel, either in masses, when it is called a *sublimate*, like arsenic; or in a feathery pulverulent state called *flowers*, as in the preparation of sulphur. Sometimes this process is improperly called dry distillation.

Testing.—The B.P., to ensure the purity and identity of its different preparations, directs in every convenient case, certain tests; thus the ordinary *Qualitative* analysis is employed frequently. Take, for example, "Acid. Aceticum," which should contain 33 per cent. of hydrogen acetate. The pharmacist is directed to show that it contains no lead, copper, sulphates, chlorides, &c., with the tests for these substances, but it is necessary to prove also that it contains the requisite percentage of acetic acid by *Quantitative* analysis, and the *Volumetric* method, which estimates the quantity by *measuring* the volume of the reagent necessary to produce the change, and afterwards calculating the weight used; and he is informed that "each gramme should require for neutralisation 5·5 cubic centimetres of the volumetric solution of sodium hydroxide." In testing the strength of diluted phosphoric acid, a different system—the *Gravimetric*—is directed. A given weight of this acid is poured upon a known weight of oxide of lead, and phosphate of lead is formed. This, after being dried, is weighed—the increase in weight giving the amount of phosphoric anhydride present. Complete volatilisation is the test used for several salts, as those of mercury.

Trituration is the process of reducing solid substances to the state of powder by continued rubbing. Generally, in pharmacy, the operation is conducted in a wedgewood mortar. (See under "Dispensing of Mixtures" and "Pills," pages 29 and 46.)

WEIGHTS AND MEASURES

OF THE

BRITISH PHARMACOPŒIA.

IMPERIAL SYSTEM.

MEASURES OF MASS.

1 Grain	gr.		
1 Ounce (Avoir.)	oz.	=	437·5 grains
1 Pound	lb. = 16 ounces	=	7000 ,,

MEASURES OF VOLUME.

1 Minim	min.		
1 Fluid Drachm	fl. dr.	=	60 minims
1 Fluid Ounce	fl. oz.	=	8 fluid drachms
1 Pint	O.	=	20 fluid ounces
1 Gallon	C.	=	8 pints

MEASURES OF LENGTH.

1 Inch	in.	
1 Foot	ft.	= 12 inches
1 Yard	yd.	= 36 inches

RELATION OF VOLUME TO MASS.

1 Minim is the measure of			0·9114583 grain of water
1 Fluid Drachm	,,		54·6875 grains of water
1 Fluid Ounce	,, 1 ounce or	437·5	,,
1 Pint	,, 1·25 pound or	8750·0	,,
1 Gallon	,, 10 pounds or	70,000·0	,,
*109·7143 minims = the measure of		100	,,

* Taken as 110 mins. throughout the B.P.

WEIGHTS AND MEASURES OF THE METRIC SYSTEM.

MEASURES OF MASS.

1 Milligramme = the thousandth part of 1 grm. or 0·001 grm.
1 Centigramme = the hundredth „ „ 0·01 „
1 Decigramme = the tenth „ „ 0·1 „
1 Gramme = weight of a cubic centimetre of water at maximum density - 1·0 „
1 Dekagramme = ten grammes or 10·0 „
1 Hectogramme = one hundred grammes „ 100·0 „
1 Kilogramme = one thousand grammes „ 1000·0 „

MEASURES OF VOLUME.

1 Millilitre = 1 cub. centim. or the mea. of 1 gram. of water
1 Centilitre = 10 „ 10 „ „
1 Decilitre = 100 „ 100 „ „
1 Litre = 1000 „ 1000 „ (1 kilo.)

MEASURES OF LENGTH.

1 Millimetre = the thousandth part of 1 metre, or 0·001 metre
1 Centimetre = the hundredth „ 0·01 „
1 Decimetre = the tenth „ 0·1 „
1 Metre - - - - - - - - - 1·0 „

RELATION OF THE IMPERIAL STANDARDS TO THE METRIC STANDARDS.

Standards of Mass.

1 Pound = 453·59243 grammes
1 Ounce = 28·34953 „
1 Grain = 0·064798918 gramme

Standards of Volume.

1 Gallon = 4·5458547 litres
1 Pint = 0·56823 litre or 568·23 cubic centimetres
1 Fluid Ounce = 0·0284115 „ 28·4115 „
1 Fluid Drachm = 0·00355144 „ 3·55144 „
1 Minim = 0·00005919 „ 0·05919 cub. centimetre

Standards of Length.

1 Yard = 0·914399 metre
1 Foot = 30·479967 centimetres
1 Inch = 2·539997 „

RELATION OF THE METRIC STANDARDS TO THE IMPERIAL STANDARDS.

Standards of Mass.

1 Milligramme = 0·01543235639 grain
1 Centigramme = 0·1543235639 „
1 Decigramme = 1·543235639 „
1 Gramme = 15·43235639 grains
1 Kilogramme = 2 lbs. 3 ozs.
119·8 grs., or 15432·35639 „

Standards of Volume.

1 Cubic Centimetre = 15·43235639 grains* = 16·9315 minims
1 Litre = 1·75985 pint, or 1 pint 15 ozs. 1 dr. 35 m.

Standards of Length.

1 Millimetre = 0·03937012 inch
1 Centimetre = 0·3937012 „
1 Decimetre = 3·937012 inches
1 Metre = 39·37012 inches, or 1 yard 3·37 inches

* The cubic centimetre is a standard at the temperature of the maximum density of water, 39·2° F., or 4° C., the grain at 62° F. (16·66° C.).

RELATION OF ENGLISH TO METRIC MEASURES.

1	Minim	=	·059 c.c.	(cubic centimetres)
2	Minims	=	·118 c.c.	,, ,,
3	,,	=	·177 c.c.	,, ,,
4	,,	=	·236 c.c.	,, ,,
5	,,	=	·295 c.c.	,, ,,
6	,,	=	·355 c.c.	,, ,,
7	,,	=	·414 c.c.	,, ,,
8	,,	=	·473 c.c.	,, ,,
9	,,	=	·532 c.c.	,, ,,
10	,,	=	·591 c.c.	,, ,,
11	,,	=	·650 c.c.	,, ,,
12	,,	=	·710 c.c.	,, ,,
13	,,	=	·769 c.c.	,, ,,
14	,,	=	·828 c.c.	,, ,,
15	,,	=	·887 c.c.	,, ,,
16	,,	=	·946 c.c.	,, ,,
17	,,	=	1·005 c.c.	,, ,,
18	,,	=	1·065 c.c.	,, ,,
19	,,	=	1·124 c.c.	,, ,,
20	,,	=	1·183 c.c.	,, ,,
25	,,	=	1·479 c.c.	,, ,,
30	,,	=	1·775 c.c.	,, ,,
35	,,	=	2·070 c.c.	,, ,,
40	,,	=	2·366 c.c.	,, ,,
45	,,	=	2·662 c.c.	,, ,,
50	,,	=	2·958 c.c.	,, ,,
55	,,	=	3·254 c.c.	,, ,,
60	,,	=	3·550 c.c.	,, ,,
1	Fluid Drachm	=	3·55 c.c.	,, ,,
2	Fluid Drachms	=	7·099 c.c.	,, ,,
3	,, ,,	=	10·648 c.c.	,, ,,
4	,, ,,	=	14·198 c.c.	,, ,,
5	,, ,,	=	17·748 c.c.	,, ,,
6	,, ,,	=	21·297 c.c.	,, ,,
7	,, ,,	=	24·847 c.c.	,, ,,
8	,, ,, (1 fl.oz.)	=	28·397 c.c.	,, ,,
2	Fluid Ounces	=	56·793 c.c.	,, ,,
3	,, ,,	=	85·190 c.c.	,, ,,
4	,, ,,	=	113·586 c.c.	,, ,,
5	,, ,,	=	141·983 c.c.	,, ,,
10	,, ,,	=	283·966 c.c.	,, ,,
15	,, ,,	=	425·949 c.c.	,, ,,
20	,, ,, (1 pint)	=	567·932 c.c.	,, ,, or ·567932 litre.
40	,, ,, (1 qrt.)	=	1135·864 c.c.	,, ,, or 1·135864 litre.

RELATION OF ENGLISH TO METRIC WEIGHTS

	(Gramme.)	(Centigrammes.)	(Milligrammes.)
1 Grain =	·0648 grm. or	6·48 c.grm. or	64·8 m.g.
2 „ =	·1296 grm. or	12·96 c.grm. or	129·6 m.g.
3 „ =	·1944 grm. or	19·44 c.grm. or	194·4 m.g.
4 „ =	·2592 grm. or	25·92 c.grm. or	259·2 m.g.
5 „ =	·3240 grm. or	32·40 c.grm. or	324·0 m.g.
6 „ =	·3888 grm. or	38·88 c.grm. or	388·8 m.g.
7 „ =	·4536 grm. or	45·36 c.grm. or	453·6 m.g.
8 „ =	·5184 grm. or	51·84 c.grm. or	518·4 m.g.
9 „ =	·5832 grm. or	58·32 c.grm. or	583·2 m.g.
10 „ =	·6480 grm. or	64·80 c.grm. or	648·0 m.g.
11 „ =	·7128 grm. or	71·28 c.grm. or	712·8 m.g.
12 „ =	·7776 grm. or	77·76 c.grm. or	777·6 m.g.
13 „ =	·8424 grm. or	84·24 c.grm. or	842·4 m.g.
14 „ =	·9072 grm. or	90·72 c.grm. or	907·2 m.g.
15 „ =	·9720 grm. or	97·20 c.grm. or	972·0 m.g.
15·432 „ =	1 Gramme or	100·00 c.grm. or	1000·0 m.g.

	(Grammes.)	(Centigrammes.)	(Milligrammes.)
1 Scruple (20 grains) =	1·296 g. or	129·6 c.g. or	1296 m.g.
2 Scruples (40 grains) =	2·592 g. or	259·2 c.g. or	2592 m.g.
3 „ or 1 Drachm =	3·888 g. or	388·8 c.g. or	3888 m.g.
1 Ounce (Troy)	= 31·104 g. or	3110·4 c.g.	

	(Grammes.)	(Centigrammes.)
¼ oz. (Avoir.) or 109·37 grs. =	7·087375 g. or	708·7375 c.g.
½ „ „ or 218·75 „ =	14·17475 g. or	1417·475 c.g.
1 „ „ or 437·5 „ =	28·3495 g. or	2834·95 c.g.
2 „ „ or 875 „ =	56·699 g. or	5669·9 c.g.
3 „ „ or 1312·5 „ =	85·0485 g. or	8504·85 c.g.
4 „ „ or 1750 „ =	113·39 g. or	11339·8 c.g.
5 „ „ or 2187·5 „ =	141·7475 g. or	14174 75 c.g.
6 „ „ or 2625 „ =	170·097 g. or	17009·7 c.g.
7 „ „ or 3062·5 „ =	198·4465 g. or	19844·65 c.g.
8 „ „ or 3500 „ =	226·7963 g. or	22679·63 c.g.
9 „ „ or 3937·5 „ =	255·1455 g. or	25514·55 c.g.
10 „ „ or 4375 „ =	283·495 g. or	28349·5 c.g.
11 „ „ or 4812·5 „ =	311·8445 g. or	31184·45 c.g.
12 „ „ or 5250 „ =	340·1945 g. or	34019·45 c.g.
13 „ „ or 5687·5 „ =	368·5435 g. or	36854·35 c.g.
14 „ „ or 6125 „ =	396·893 g. or	39689·3 c.g.
15 „ „ or 6562·5 „ =	425·2425 g. or	42524·25 c.g.
16 „ „(1 lb.) or 7000 „ =	453·5927 g. or	45359·27 c.g.

RELATION OF METRIC TO ENGLISH WEIGHTS.

1 Milligramme, or ·001 gramme	=		$\frac{1}{65}$	grain.
1 Centigramme, or ·01 „	=		$\frac{2}{1.8}$	„
1 Decigramme, or ·1 „	=		$1\frac{1}{2}$	grains.
1 Gramme (1 millilitre)	=	nearly	$15\frac{1}{2}$	„
5 Grammes	=		$77\frac{1}{6}$	„
10 „ (1 centilitre)	=		$154\frac{1}{3}$	„
20 „	=		$308\frac{2}{3}$	„
30 „	=	1 ounce and	$25\frac{1}{2}$	„
40 „	=	1 „ and	$179\frac{3}{4}$	„
50 „	=	1 „ and	334	„
60 „	=	2 ounces and	51	„
70 „	=	2 „ and	$205\frac{1}{6}$	„
80 „	=	2 „ and	$359\frac{1}{2}$	„
90 „	=	3 „ and	$76\frac{1}{3}$	„
100 „ (1 decilitre)	=	3 „ and	$230\frac{3}{4}$	„
200 „	=	7 „ and	24	„
300 „	=	10 „ and	$254\frac{2}{4}$	„
400 „	=	14 „ and	48	„
500 „	=	17 „ and	$278\frac{3}{4}$	„
600 „	=	21 „ and	72	„
700 „	=	24 „ and	$302\frac{3}{4}$	„
800 „	=	28 „ and	96	„
900 „	=	31 „ and	$326\frac{3}{4}$	„
1000 „ (1 kilogramme or 1 litre)	=	35 „ and	120	„

RELATION OF METRIC TO ENGLISH MEASURES.

1 c.c. (cubic centimetre)	=	16·9	minims.
2 c.c. „ „	=	33·8	„
3 c.c. „ „	=	50·7	„
4 c.c. „ „	=	1 dr. 7·61	„
5 c.c. „ „	=	1 dr. 24·5	„
6 c.c. „ „	=	1 dr. 41·41	„
7 c.c. „ „	=	1 dr. 58·32	„
8 c.c. „ „	=	2 drs. 15·22	„
9 c.c. „ „	=	2 drs. 32·12	„
10 c.c. „ „	=	2 drs. 49·03	„
15 c.c. „ „	=	4 drs. 13·54	„
20 c.c. „ „	=	5 drs. 38·06	„
25 c.c. „ „	=	7 drs. 2·57	„
30 c.c. „ „	=	1 oz. 0 drs. 27·09	„
40 c.c. „ „	=	1 oz. 3 drs. 16·12	„
50 c.c. „ „	=	1 oz. 6 drs. 5·15	„
75 c.c. „ „	=	2 oz. 5 drs. 7·7	„
100 c.c. „ „	=	3 oz. 4 drs. 10·3	„
500 c.c. „ „	=	17 oz. 4 drs. 51·5	„
1000 c.c. „ „ (1 litre)	=	35 oz. 1 dr. 43	„

PART II.

THE

ADMINISTRATION OF MEDICINES.

METHODS OF ADMINISTERING MEDICINES.

THERE are various routes by which medicines may find their way into the circulating fluid. The most direct would be

(1) *By injection into the veins :* as ammonia, saline solutions, and milk are injected in desperate emergencies, or as blood may be transfused after excessive hæmorrhages.*

(2) Some authorities recommend the *injection* of the remedy *into an artery.*

(3) By *inhalation*, the vapour of the substance finding its way rapidly into the circulation through the extensive sheet of pulmonary blood vessels, as in the administration of anæsthetics.

(4) By *swallowing*—the commonest and most convenient method—the medicines finding their way through the walls of the gastro-intestinal blood vessels, or lacteals, into the current.

(5) By absorption from the *rectum ;* in this way the great majority of substances (in the form of enemata or suppositories) may find their way into the blood.

* The ordinary aspirator (Dieulafoy's) can be safely used for this purpose if the two rubber tubes are made exactly alike, and are each rendered capable of bearing one of the large needles at one end, whilst the other end is connected with the cylinder of the machine. In this way a thoroughly reliable transfusion apparatus can be always at hand. (See the Author's " Dictionary of Treatment " (3rd Edition), page 38.

(6) By absorption from the *vaginal* surface in the female, when given in the form of pessary.

(7) By absorption from the *bladder*. Some experimentalists have influenced the system by narcotic remedies injected into the vesical cavity.

(8) By absorption from the *peritoneal* cavity, as has been recently proposed in cases of severe hæmorrhages by injecting saline solutions, milk, &c., into the sac of the peritoneum.

(9) By absorption from the *deep tissues*, as strychnine is often injected into the centre of a large muscle, by the method known as "*parenchymatous injection*."

(10) By the *hypodermic method*, a solution or mixture containing the substance being injected by a fine syringe into the *subcutaneous areolar tissue*, from which it is rapidly absorbed by the small blood vessels and lymphatics. In this way morphine is best given to relieve severe pain, and ether to counteract the shock of formidable hæmorrhages.

(11) By the skin. Through the cutaneous tissue medicines may be administered with the view of affecting the system, by four methods:—

1. The Enepidermic. 2. The Epidermic or Iatroleptic.
3. The Endermic. 4. By Inoculation.

In the *Enepidermic* method friction is not employed; the medicine to be so administered is simply placed in contact with the skin. Though this is, at the best, a slow and uncertain way to introduce a remedy into the circulation, the results of experiments show that the alkaloids dissolved in chloroform, when placed in contact with the unbroken skin, are readily absorbed, and soon find their way into the blood. Waller has shown that this endosmotic quality of chloroform enables it to penetrate the skin of the cadaver and to carry the alkaloids with it. Watery or alcoholic solutions either do not enter the blood at all when administered in this way, or are absorbed in such small quantities that they may be regarded as inert. Guaiacol painted over the skin and covered with oiled silk is rapidly absorbed, and reduces temperature in this way, and so does sparteine.

By the *Epidermic* method the medicine is also introduced into the system through the unbroken cuticle, but friction is employed. In this way we administer cod-liver oil in wasting diseases, and mercurial ointment in syphilis.

By the *Endermic* method the difficulty of absorption through the cuticle is obviated by its removal. This is accomplished by soaking a piece of porous fabric in strong solution of ammonia, applying it to the surface of the skin, and instantly

covering it over with a piece of oiled silk, or a watch-glass, when speedy vesication ensues. The remedy, in the state of fine powder, should be dusted over the denuded spot, when its rapid absorption will occur. In this way morphine, strychnine, or atropine can be administered. The same result follows if the remedy be applied over a portion of skin whose cuticle has been removed by an ordinary blister.

By the operation of *Inoculation* (as for small-pox) remedies may be introduced into the system through the punctured cuticle.

These different methods or routes by which medicines find their way into the system should not be confounded by the student with the various *local* methods of applying remedies. Thus, sternutatories are applied to the nasal mucous membrane, and substances, by the method of insufflation, are brought in contact with the posterior nares and surrounding parts; or the nasal douche may be employed with the same intention. Sialagogues are used to act on the salivary glands through stimulation of the nerves distributed to the mucous membrane of the mouth.

The fauces and tonsils are reached by gargles, and the larynx by atomised spray; while the bronchial mucous surface may be exposed to the local action of various inhalations, or to the fumes of volatile substances in a state of combustion.

In the same way, most of the cavities of the body, all tortuous wounds, and open sores, may be reached by injections, lotions, bougies, pessaries, suppositories, &c.

DOSAGE OR POSOLOGY.

Before the student considers the question of prescription writing, it will be necessary to say a few words about the doses of medicines. As the alphabetical arrangement of this work will enable him to find at a glance the dose of every drug in the Materia Medica, and in a similar way the doses of all the various Galenical preparations are tabulated, it will thus be unnecessary here to have any repetition in the form of tables or lists of doses.

Though the official doses may be regarded as safe guides, still the student must remember that there are many conditions which modify very considerably the effect of remedies, and should materially affect their dosage.

The most important of these modifying agents are :—

Age, *Idiosyncrasy*, *Habit*, *Interval between the Doses*, *Disease*, *Climate*, *Race and Temperament*, *Sex*, *Body Weight*, *Method and Form in which the Medicine is Administered*, *Temperature*, *Hour of the Day*, *Mental Emotion*, *Fasting*, *Cumulative Action*, *&c.*

Age—This is the most important factor in determining the amount of the dose, and is the one which gives most trouble to the student. In the Materia Medica portion of this book, the dose for a child one year old is given under the heads of the most frequently employed infantile remedies. It should be remembered that children bear opiates very badly, and their use, consequently, is unsafe for children under one year old, even in most minute doses.

This intolerance of opium, it may be, has led to very erroneous ideas about the amount of the dose of other remedies for children.

Children will often bear nearly as full doses as adults, of various remedies, as may be seen in the case of arsenic, calomel, squill, belladonna, ipecacuanha, and many purgatives, like rhubarb, jalap, &c.

Gaubius took the average adult dose of a remedy as 1, say 1 grain, and calculated the requisite amount for the different ages thus :—

For a child 1 year old, $\frac{1}{12}$ gr. ; 2 years old, $\frac{1}{8}$ gr. ; 3 years old, $\frac{1}{6}$ gr.; 4 years old, $\frac{1}{4}$ gr.; 7 years old, $\frac{1}{3}$ gr.; 14 years old, $\frac{1}{2}$ gr.; 20 years old, $\frac{2}{3}$ gr.; and for ages between 21 and 60 years, 1 gr.

Young's rule is—" That for children under 12 years the doses of most medicines must be diminished in the proportion of the age to the age increased by 12."

If the student wishes to find out the dose for a given age by this method, he has simply to add 12 to the age in years, and divide the age by the amount thus obtained, the answer giving a fraction, which is the required amount of the full adult dose. Thus, suppose the adult dose to be 1 grain, the dose will be :—

For a child 1 year old ... $\frac{1}{1+12} = \frac{1}{13}$ grain.

For a child 2 years old ... $\frac{2}{2+12} = \frac{1}{7}$ grain.

For a child 3 years old ... $\frac{3}{3+12} = \frac{1}{5}$ grain.

For a child 8 years old ... $\frac{8}{8+12} = \frac{2}{5}$ grain.

For a child 12 years old ... $\frac{12}{12+12} = \frac{1}{2}$ grain.

Cowling's rule is to divide the number representing the age of the patient upon his next birthday by 24. Thus a child $5\frac{1}{2}$ years old would receive $\frac{6}{24}$ or $\frac{1}{4}$ of the full adult dose of ordinary remedies.

Brunton, in order to make Cowling's rule adapt itself to the metric system, proposes to use the number 25 instead of 24, and to multiply both the numerator and denominator of the fraction by 4. Thus, for a child 3 years, the dose would be ascertained in this way—

$$\frac{4}{25} = \frac{16}{100} = \cdot 160$$

Suppose the adult dose to be 1 gramme, the child of 3 years would receive ·160 gramme, or 16 centigrammes.

Idiosyncrasy—The physician meets with individuals in whom an ordinary dose of some well-known drug causes symptoms more intense, or entirely different from those usually observed to follow its administration, and when these cannot be accounted for by any known law, the case is generally regarded as one of idiosyncrasy.

Patients are occasionally met with in whom the smallest dose of calomel will be followed by profuse salivation, whilst enormous doses of opium and chloroform are sometimes borne by those unaccustomed to their use. Iodide of potassium is the best example of a drug whose action is occasionally modified by some idiosyncrasy in the patient.

Habit determines the dose of some medicines more than any other influence ; this is particularly true of narcotics. Many instances are recorded of opium eaters who took a pint of laudanum daily without experiencing the soporific effects of the drug, and the arsenic eaters of Styria are examples of the same.

The *Interval between the Doses* should determine to a large extent the amount of the dose ; this is too frequently overlooked in tables. No rule can, however, be laid down on the subject, but the student should be guided by the nature of the action of the medicine, the effects required to be produced by it, and the rate of its absorption, &c. The new B.P. gives for certain remedies two series of doses—the larger as a single dose, and the smaller for repeated administration.

Disease modifies considerably the dose of a medicine ; instances of this may be seen in the large quantities of opium needed in desperate inflammations and intensely painful conditions of various nerves. Mercury and opium are badly borne in albuminuria, whilst in syphilis large quantities of mercury can be freely given.

Climate and *Temperament* possess varying effects upon the amount of medicine required to produce its results in a healthy individual.

The *Temperature* of the patient and of the surrounding atmosphere has a very decided effect upon the dose of many medicines. Brunton has found that substances like veratrine,

strychnine, &c., act in entirely different ways according as the temperature is high or low, this possibly being to some extent the explanation of the indication for the administration of stimulants in the *early morning* in severe fevers.

Fasting—The rapidity with which medicines are absorbed and affect the system in this condition is well recognised.

The *Method by which the Medicine is Administered* affects the dose: thus, as a rule, the dose of remedies given by the rectum requires to be twice as great as if given by the mouth. Strychnine is an exception, being more active when given by the bowel than if swallowed. The dose may be said to be about a half, or two-thirds of the ordinary quantity when administered by the hypodermic method.

The *Form in which the Medicine is Administered* may affect its action, thus the active principles of drugs when isolated and given in a soluble form will act with greater rapidity and intensity than the corresponding amount of the crude drug, and some *conditions of the medicine* itself (chiefly those which relate to its rate of absorption or elimination) affect materially the amount of the dose.

Sex and Body Weight materially affect the action and dose of some drugs; as a rule, women require smaller doses, and the dose should be less for a man weighing 100 lbs. than for one double this weight.

Accumulation or Cumulative Action modifies to some extent the dose of a medicine. After digitalis, strychnine, or bromide of potassium has been administered for a time some observers have noticed the sudden onset of the marked physiological symptoms produced by these remedies. In such a case the dose must be diminished or suspended; and after its renewal the interval between the doses should be lengthened. The explanation in these cases is clearly that the elimination of the drug has been interfered with; the active principle of digitalis so contracts the renal vessels that its exit from the system is delayed; the same is true of strychnine as pointed out by Gärtner.

INCOMPATIBILITY.

It is of the utmost importance that the physician should avoid ordering remedies which, when mixed, destroy each other's virtues. Incompatibility is generally said to be threefold :—

1. *Chemical.* 2. *Therapeutical.* 3. *Pharmaceutical* or *Absolute.*

Of the first may be instanced syrup of squill and sal volatile; acetate of lead and sulphuric acid or sulphate of zinc; iron and the numerous substances containing tannic acid.

As an example of the second form of incompatibility may be mentioned a mixture, or pill, containing strychnine and Calabar bean.

Substances are said to be *absolutely* incompatible when they cannot be mixed together by the pharmacist, as borax and mucilage, or tincture of tolu, myrrh, or benzoin, when ordered with water. (See page 35).

Experience proves that many compounds, regarded formerly as incompatible, are valuable combinations. It does not follow if a mixture be *inelegant* that it is worthless, though some consider such should be regarded as incompatible and never employed. The official Mist. Ferri Co. and the formerly official Mist. Ferri Aromat. may be cited as popular preparations, though instances of incompatibles. Antipyrine should not be prescribed with spirit of nitre, iodine, Prussic acid, and ferric salts.

Unfortunately no rule can be laid down to prevent the student ordering substances which oppose each other in their action in the system, or which chemically decompose each other, or which will refuse to take the intended shape from the hand of the dispenser. Nevertheless, a fair preliminary knowledge of chemistry and pharmacology will generally prevent such a mistake.

Amongst the various general rules of incompatibility there is one which the student should remember—*that a drug should never be ordered in combination with any of its tests or antidotes.*

The substances in the following short list can be combined with so few preparations that the student will be wise to order them alone in simple solution.

> Permanganate of Potassium, Tannic and Gallic Acids, Corrosive Sublimate, Iodide of Potassium, Salts of Lead, Salts of Zinc, Iodine and its liquid preparations, Nitrate of Silver, Tincture of Guaiacum, Citrate of Iron and Quinine, Free Chlorine in solution.

The student should turn to the short article on page 69 dealing with "Incompatibility" in dispensing.

The following excellent summary of incompatibilities is from "The Art of Dispensing":—

LIST OF INCOMPATIBILITIES.

Acid arsenious, with lime-water, oxide of iron, magnesia.

Acids generally, with alkalies, acetates, metallic oxides.

Albumen, with acids, spirit, tannin, corrosive sublimate.

Alkaloidal salts generally, with tannin, alkaline and earthy carbonates, iodine and its compounds, liquorice, strong mucilages, alkaline and ammoniated tinctures.

Alum sulphate, with alkalies and alkaline carbonates.

Ammonium bromide, with mineral acids, alkaline carbonates, chlorine, chlorate and bichromate of potash, nitrate of silver, calomel.

Apomorphine (hydrochlorate) with carbonate and bicarbonate of soda, salts of iron, iodine, and tannin.

Barium chloride, with sulphuric and phosphoric acids and their salts, tartrates and carbonates, medicinal wines and vegetable infusions.

Bicarbonate of soda, with acids, tannin, salts of the metals and of the alkaloids.

Bismuth subnitrate, with tannin, sulphur, sulphide of antimony, calomel.

Chloral hydrate, with water (slow decomposition), warm water, alkaline carbonates, vegetable alkalies, ammonia salts, nitrate of mercury, calomel.

Chlorate of potash, with mineral acids, organic substances, sulphur, carbon, calomel, iodide of iron, &c.

Chlorine (chlorine-water), with alkalies, alkaline carbonates, salts of ammonia, vegetable salts, nitrate of silver, lead salts, tannin, vegetable mucilages, extracts, waters, infusions, tinctures and syrups, milk, and emulsions.

Corrosive sublimate, with carbonates, lime-water, iodide of potassium, opium, vegetable infusions, tannin, but compatible with the carbonates of lime, baryta, and strontia, either in powder or super-carbonated solution.

Digitalis, with tannin, sugar of lead, iodine, iodide of potassium, alkaline carbonates.

Golden sulphuret of antimony, with bicarbonate of soda, cream of tartar, calomel, subnitrate of bismuth.

Gum arabic, with perchloride of iron, lead salts, spirit, ethereal tinctures, borax.

Iodine, with ammonia, starch, metallic salts, fatty or essential oils, emulsions, chloral, earthy carbonates, gum arabic, tragacanth, salep.

Iron powdered (iron reduced by hydrogen), with aloes, vegetable infusions and extracts, tannin, metallic and alkaloidal salts.

Iron salts, with alkaline carbonates, vegetable infusions and extracts, tannin, mucilage.

Lime-water, with acids, carbonates, ammonia salts, metallic salts, tartrates, infusions, tinctures, tannin.

Morphine and its salts, with oxide of iron, salts of iron, manganese, and silver.

Musk, with acids, acetates, tannin, ergot of rye, metallic salts.

Nitrate of silver, with hydrochloric, sulphuric, acetic, and tartaric acids and their salts, hydrocyanic acid and its compounds,

iodine, iodide and bromide of potassium, alkaline and earthy carbonates, sulphur, and sulphide of antimony.

Nitrite of amyl, with tinctures, alkaline carbonates, calomel, lead salts, proto-salts of iron, iodide of potassium.

Opium, with alkaline carbonates, salts of the metals, tannin, iodine, chlorine-water, and nux vomica. Although opium and belladonna are supposed to be physiologically incompatible, they are often administered together with good results.

Pepsin, with alcohol, tinctures.

Permanganate of potash, with organic substances.

Salicylic acid and salicylate of soda, with iron salts, iodide of potassium, lime-water.

Strophanthus (tincture) in water undergoes hydrolysis, with formation of a toxic substance.

Tannin, with mucilage, all metallic salts, lime-water, alkaline carbonates and bicarbonates, egg albumen, gelatin.

Tartar emetic, with acids, alkalies, soap, calomel, tannin, rhubarb, cinchona, gum arabic, opium.

The various prescriptions scattered throughout the portion of this work devoted to Therapeutics will materially assist the student in selecting elegant and useful forms in which to administer the most important remedies. Some, indeed, of these may be open to the objection of containing incompatible substances, as iodide of potassium and corrosive sublimate; but where a combination has been proved by experience to be valuable, its inelegance or supposed incompatibility has been occasionally overlooked.

THE COMBINATION OF MEDICINES.

The compounds of the last generation, containing numerous absurd and incompatible ingredients, have, it is to be feared, forced many into the opposite extreme of simplicity. In this way combinations of remedies of the utmost value have fallen into disuse.

Paris pointed out the great advantages to be derived from a judicious combination of medicines: thus he found that the action of a medicine may be increased by combining several different preparations of it. Suppose, for example, we wish to get *all* the virtues of cinchona, we obtain them best from a mixture like the following:—

℞ *Ext. Cinchonæ Liq.* ℥ij.
Tinct. Cinchonæ ℥j.
Decoct. Cinchonæ (B.P. 85) ℥iv.
Infus. Cinchonæ ℥x. *misce.*

Fordyce showed that a much more valuable and reliable remedy may be obtained by combining various substances whose actions resemble, or are identical with, each other. Thus the best diuretic would be a mixture of digitalis, squill, broom, and bicarbonate of potassium, infinitely superior to a proportionate dose of any one of them when administered singly.

The action of some medicines is increased by combining with them substances, the previously known qualities of which would have given no clue to their usefulness in this respect; thus the diuretic power of digitalis and squill is intensified by mercury.

By the judicious combination of two or more remedies we are often enabled to correct undesirable qualities possessed by one of them; thus alkalies correct the griping of aloes, and hyoscyamus that of colocynth; arsenic prevents the acne which follows the administration of bromide of potassium; and atropine corrects the unpleasant symptoms caused by a hypodermic dose of morphine.

By a regulation of the dose of various remedies of the same class, though differing in their methods of action, occasionally a better compound may be obtained, as pointed out by Paris; thus by giving a cholagogue with a saline, more effectual purgation is obtained; or by combining bromide of potassium with a narcotic, a more prolonged hypnotic action may be produced.

WEIGHTS, MEASURES, AND SYMBOLS USED IN PRESCRIBING.*

The weights used in prescribing and dispensing are of the official system, which starts with the Troy grain and ends with the Avoirdupois pound.

1 Grain,	*gr.*		
1 Ounce,	*oz.*	=	437·5 grs.
1 Pound,	*lb.*	=	7,000 grs.

The official Measures of Capacity which are generally met with in prescriptions are:—

1 Minim, *min.*	=	·91 grs. of water.
1 Fluid Drachm, *fl. dr.* = 60 minims	= 54·68	,, ,,
1 Fluid Ounce, *fl. oz.* = 8 fluid drs.	= 437·5	,, ,,

* Upon pages 82, 83, and 84, will be found a full table of the Weights and Measures of the British Pharmacopœia.

It will thus be noticed that there is no *official* weight between 1 grain and 1 ounce: but the ℥i. and ℈i., which represented the $\frac{1}{8}$ and $\frac{1}{24}$ part of the old Troy ounce, are still permitted to exist under protest. They are, when used in a prescription, to be taken as meaning 60 grs. and 20 grs. respectively, and not the $\frac{1}{8}$ and $\frac{1}{24}$ of the Avoirdupois ounce, which would be 54·68 and 18·22 grains respectively.

The French Gramme, = 15·432 grs.

The following are the symbols and signs met with in prescription writing; they must not be confounded with the *official* symbols, which are simply the first two letters of the English words, as fl. oz., fl. drm., &c.

Gr. = Granum, 1 grain = $\frac{1}{480}$ of a Troy ounce, or $\frac{1}{437}$ of an Avoirdupois ounce.

℈. = Scrupulum, 1 scruple = 20 grains.

℥. = Drachma, 1 drachm = 60 grs. or 3 scruples; or $\frac{1}{8}$ of a *fluid* ounce, or 60 minims.

℥. = Uncia, 1 ounce = 1 Troy oz. (480 grs.) or 1 fluid oz. (480 minims), or 437·5 grains of water.

M. = Minimum, 1 minim = $\frac{1}{60}$ part of a fluid drachm or the volume of ·91145 grains of water.

Gtt. = Gutta, 1 drop, erroneously supposed to represent 1 minim.

O. = Octarius, 1 pint, = 20 fluid ounces, or $1\frac{1}{4}$ lbs. of water.

C. = Congius, 1 gallon, = 8 pints, or 10 lbs. of water.

DOMESTIC MEASURES.

A tea-spoonful—Cochleare minimum = 1 fluid drachm (℥j.)

A dessert-spoonful—Cochleare medium = 2 fluid drs. (℥ij.)

A table-spoonful { Cochleare amplum or Cochleare magnum } = 4 fluid drs. or $\frac{1}{2}$ oz. (℥iv. or ℥ss.)

A wine-glassful—Cyathus vinarius = $2\frac{1}{2}$ fluid oz. (℥iiss.)

The practice of measuring medicines in spoons is open to very serious objections, since seldom will two be found just alike in capacity, and the physician should make a rule of examining the spoon and ascertaining its dimensions before the patient uses it as a measure. The common "kitchen" spoon, which is generally made of iron and coated over with tin, fluctuates less in size than the other domestic measures; it can be relied upon as holding two fluid drachms. The wine-glass is generally stated to contain $1\frac{1}{2}$ to 2 ozs. It will, however, be nearly always found to contain at least $2\frac{1}{2}$ ozs., or the eighth part of an imperial pint. The writer believes that

most physicians when ordering medicine to be taken in doses of a wine-glassful, calculate upon the wine-glass containing at most 2 ozs. This idea arises from the old wine-glassful being equal to the $\frac{1}{8}$ part of the old wine pint of 16 ozs.

A small tea-cup contains on an average about 7 fluid ounces, and a breakfast-cup about 12 fluid ounces. These figures are much above those mentioned in most books.

An ordinary tumbler holds generally half-a-pint. In all cases where the physician prescribes an *active* medicine he should order the dose to be measured in a graduated glass.

The mistake of counting drops as minims has been already referred to in the Pharmacy section (p. 25).

PRESCRIPTION WRITING.

In one sense, this may be said to be the highest accomplishment of the educated physician, since it requires for its correct performance an intimate knowledge of all the medical sciences, and a practical acquaintance with the art of pharmacy. It is to be regretted that a more intimate knowledge of this latter art is not cultivated by the student of medicine. There could scarcely be a more erroneous idea than that which one occasionally meets with—*i.e.*, that pharmacy is beneath the notice of the physician.

The writer believes there are very few things which give so great advantages in after life to the physician as an intimate acquaintance with this art.

The Model Prescription should consist of the following parts :—

1. *The Superscription.* 2. *The Inscription.* 3. *The Subscription.* 4. *The Signature.*

1. The *Superscription*, which consists of the letter R, originally was used, it is supposed, to represent the symbol of the planet Jupiter, at a time when much of the virtue of a combination appeared to rest upon the deity or presiding star. By common consent, it is now regarded as representing the imperative mood of the Latin verb Recipio, to take ; and the French accordingly commence their prescriptions with P., or Prenez.

2. The *Inscription* may be called the *body* of the prescription ; it includes the names of the substances to be administered, with their quantities, written in Latin, and as it is the most important part of the prescription, it will be referred to presently at more length.

3. The *Subscription* is made up of the directions (in Latin) for the guidance of the dispenser; thus *misce*, often written *m.*, is frequently the only part in a prescription which belongs to the subscription.

4. The *Signature* includes the directions or instructions intended for the benefit of the patient. They are frequently written by the prescriber in English, and many recommend that Latin should never be used for this part of the prescription.

Mistakes are certainly more liable to occur if the signature be written carelessly, or if incorrect Latin be employed, but the same reasons which have determined the use of this language for prescriptions from an early time, apply equally well to the signature. Thus a prescription written in Latin can be read and understood in every civilised country. Abbreviations and contractions can be employed without fear of being misunderstood, which could not be the case if any other language were substituted; we are thus often able, by a single letter, to express the meaning of several English words.

It is often absolutely *necessary* to write the inscription in such a way that the patient may remain innocent of the nature of its contents.

The use of long and elaborate Latin phraseology is to be condemned in prescribing, and the student, when he feels any difficulty in expressing himself in this tongue, had certainly better fall back upon his English when writing the signature. This he can do by using the Latin word Signa, after which the signature may be written in unabbreviated English.

The patient's name is written at the top or bottom of the recipe, preferably the top, as it is thus less liable to be overlooked or mistaken than if written where space is often limited. The prescriber's initials generally follow at the right hand corner, and the date is written opposite.

☞ The student should not confound the *initials* of the prescriber with that portion of the prescription called the signature—*i.e.*, the directions to the patient.

It is hardly necessary to remind the student of the necessity of writing clearly and legibly, and of avoiding the use of such contractions as might lead to mistakes.

The *body* or inscription of a model prescription should contain the following:—

The *Basis*, or principal active ingredient.

The *Adjuvant*, or *Auxiliary*, to assist its action.

The *Corrective*, to correct or diminish some undesirable quality.

The *Vehicle*, or *Excipient*, to give a suitable form for administration.

The following prescription may be regarded as a very commonly ordered combination of remedies :—

℞		Superscription.
(Basis.)	*Pot. Acet.* ʒv.	Inscription.
(Adjuvant.)	*Tinct. Digitalis* ʒj.	
(Corrective.)	*Syr. Aurantii* ℥j.	
(Vehicle.)	*Inf. Scopar. ad* ʒviij.	
Misce, fiat mist.		Subscription.
Cpt. Cochl. mag. ii. 4ta. q.q. hora ex paul. aquæ.		Signature.

Without abbreviations or contractions it would read thus :—

Recipe

Potassii Acetatis drachmas quinque.
Tincturæ Digitalis drachmam unam.
Syrupi Aurantii unciam unam.
Infusum Scoparii ad uncias octo.

Misce, fiat mistura. Capiat cochlearia duo magna quartâ quâque horâ ex paululo aquæ.

The student will find benefit from a careful study of the following pages, in which the Latin of the above prescription is arranged according to the English idiom, and each word parsed and translated.

Latin Idiom :

Recipe Potassii Acetatis drachmas quinque.

℞ (Recipe)	... v. irr. tr. im. m. 2nd per. s., to agree with its nom. *Tu*—"thou"(understood). Rule i., recipi-o, recep-i, recep-tum, recipere.	Take thou
v (quinque)	... num. adj. indec. ac. pl. qual. and agreeing with drachmas. Rule ii.	five
ʒ (drachmas)	... n. f. ac. pl. Rule viii. (*a*) drachma—æ.	drachms
Acet. (acetatis)	... n. f. gen. s. qual. drachmas. Rule vi. (*a*), acetas—atis.	of acetate
Pot. (potassii)	... n. n. gen. s. qual. acetatis. Rule vi. (*a*), potassium—ii.	of potassium.

Latin Idiom:

Recipe Digitalis Tincturæ drachmam unam.

℞ (Recipe) ... (understood) Take thou

j (unam) ... { num. adj. ac. s. qual. and agreeing with drachmam. Rule ii., unus—a—um. } one

ʒ (drachmam) ... { n. f. ac. s. gov. by recipe. Rule viii. (*a*), drachma—æ. } drachm

Tinct. (tincturæ) ... { n. f. gen. s. qual. drachmam. Rule vi. (*a*), tinctura—æ. } of the tincture

Digit. (digitalis) ... { n. f. gen. s. qual. tincturæ. Rule vi. (*a*), digitalis—is. } of digitalis.

Latin Idiom:

Recipe Aurantii Syrupi unciam unam.

℞ (Recipe) ... (understood) Take thou

j (unam) ... (parsed as before) one

ℨ (unciam) ... { n. f. ac. s. gov. by recipe. Rule viii. (*a*), uncia—æ. } ounce

Syr. (syrupi) ... { n. m. gen. s. qual. unciam. Rule vi. (*a*), syrupus—i. } of syrup

Aur. (aurantii) ... { n. neu. gen. s. qual. syrupi. Rule vi. (*a*), aurantium—ii. } of orange

Latin Idiom:

Recipe Infusum Scoparii ad uncias octo.

℞ (Recipe) ... (understood) Take thou

*Infus.**(Infusum) .. { n. neu. s. acc. gov. by recipe. Rule viii. (*a*), infusum—i. } infusion

Scop. (scoparii) ... { n. masc. gen. s. qual. infusum. Rule vi. (*a*), scoparius—ii. } of broom

Ad ... prep. gov. uncias. Rule viii. (*b*) up to

viij (octo) ... { num. adj. indec. qual. uncias. Rule ii. } eight

ℨ (uncias) ... { n. f. ac. pl. gov. by ad. Rule viii. (*b*), uncia—æ. } ounces.

☞ N.B.—The student must have a clear idea of the meaning of this Ad. It means that the dispenser, after measuring the other ingredients, must add enough of the infusion to make the entire quantity measure 8 ozs.

☞ * Some authorities would put Infus. in the genitive—a partitive genitive—*i.e.*, "of infusion." In the same way, where the student meets *Aquam ad* ℨ—, in the different prescriptions throughout the Fourth Part of this work, he may substitute *Aquæ ad* ℨ. Either form is correct.

Latin Idiom:

Misce, fiat mistura.

M. (misce) .. { v. trans. imp. m. p. t. agreeing with and gov. by tu (understood). Rule i., misceo, -ui, mixtum or mistum, miscere. } Mix you, or mix,

Mist. (mistura) ... { n. f. nom. s. governing fiat. Rule i., mistura—æ. } let a mixture

Ft. (fiat) ... { v. used as passive of facio, pres. sub. 3rd s., used as imp. gov. by and agreeing with mistura; fio, factus sum, fieri; to be made or become. } be made.

Latin Idiom:

Capiat cochlearia magna duo quarta quâque horâ ex aquæ paululo.

Cpt. (capiat) ... { irr. v. tr. sub. m. pr. t. 3rd per. s., agreeing with and gov. by (is) understood. Rule i., capio, cepi, captum, capere, the present subjunctive used as an imperative. Rule x (*a*). } He may take, or let him take,

ij (duo) .. { num. adj. ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., duo—æ—o. } two

Mag. (magna) ... { adj., ac. pl. neut. qual. and agreeing with cochlearia. Rule ii., magnus—a—um. } large

Coch. (cochlearia) { n. ac. pl. neut. gov. by capiat. Rule viii. (*a*), cochlear—is. } spoonfuls

q.q. (quâque) ... { pron. indef. abl. s. qualifying and agreeing with hora. Rule ii., quisque, quæque, quodque. } at each

4ta (quarta) ... { num. adj. abl. s. qualifying and agreeing with hora. Rule ii., quartus—a—um. } fourth

Hora ... { n. f. abl. s. Rule ix. (*a*), hora —æ. } hour

Ex ... prep. Rule ix. (*c*) out of (in)

Paul. (Paululo) ... { adj. abl. s. used as a noun, gov. by ex, paululus—a —um. } a little

Aq. (aquæ) ... { n. f. gen. s. qual. paululo. Rule vi., aqua—æ. } of water.

GRAMMATICAL AIDS TO PRESCRIPTION WRITING.

Two languages differ in *words*, *inflections*, and *idioms*.

"A student who wishes to read the Latin language must thus understand the *meaning* of its words, the *force* of its inflections, and the *nature* of its idioms."

As far as the *words* are concerned, a limited knowledge of this language, and one sufficient for the intelligent reading and writing of physicians' prescriptions, may be obtained from the following brief vocabulary.

The *inflections* may be learned from any Latin grammar; whilst the student may obtain a fair conception of the *idioms* or order of words from a careful study of the few important rules of Syntax which follow.

A FEW RULES OF LATIN SYNTAX, APPLICABLE TO THE CONSTRUCTION OF PHYSICIANS' PRESCRIPTIONS.

Syntax is generally divided into two parts—CONCORD and GOVERNMENT.

Concord is the agreement between two Latin words, one influencing the other. There are three concords:—

1. A verb, with its subject (as Rule I.).
2. Adjectives, with the nouns which they qualify. (Rule II.)
3. The Relative, with its antecedent. (Rule III.)

RULE I.

A personal verb agrees with its subject or nominative, in number and person; as, *Ego tero*—I rub; *Tu sumas*—You may take; *Id fiat*—It may be done.

In prescription writing, the *active* voice of verbs is generally only used in the 2nd person singular of the imperative mood, and 3rd person singular or plural of the present subjunctive.

The use of the *passive* voice is generally confined to the 3rd person singular or plural of the present subjunctive, and the different parts of the Gerundive.

RULE II.

Adjectives, participles, and pronouns, whether belonging to the subject or the predicate, agree in gender, number, and case with the noun or the pronoun to which they refer; as *Pulvis unus*—One powder; *Uncia una*—One ounce; *Sevum Præparatum*—Prepared suet.

Rule III.

The relative must agree with its antecedent in gender, number, and person ; as, *Syrupus qui optimus est*—The syrup which is best ; *Mistura quæ bona est*—The mixture which is good ; *Medicamentum quod neglectum est*—The medicine which has been neglected.

Rule IV.

If a verb has more than one subject the verb must be put in the plural number ; as *Pilula et mistura capiantur*—The pill and mixture are to be taken.

Rule V.

A participle governs the same case as the verb to which it belongs ; as *Augendo Quantitatem*—By increasing the quantity.

Rule VI.

The Genitive case primarily signifies the class to which a thing belongs ; therefore—

(a) It depends on another noun as a notion which it qualifies or determines ; as, *pulveris granum*—a grain of powder.

(b) Or it is used to signify the whole from which a part is taken; as, *nimium doloris*—too much (of) pain.

(c) Adverbs of quantity, time, place, &c., govern the Partitive Genitive ; as, *satis aquæ*—enough (of) water.

(d) Adjectives of plenty or want govern a Genitive or Ablative ; as, *dives quininæ*—rich in quinine ; *dives aqua*—rich in water.

Rule VII.

Dative.—The sign of the Dative case is *to* or *for*.

(a) Adjectives which imply likeness or unlikeness, advantage or disadvantage, &c., govern the Dative ; as, *ceræ similis*—like to wax.

(b) Verbs of giving or imparting, &c., govern the Dative of the indirect object as well as the Accusative of the direct object : *contusam liquori redde* — return the bruised (substance) to the liquor.

Rule VIII.

Accusative.—The Accusative was originally used to mark the immediate object of an action.

(a) Transitive verbs in the active voice generally govern the Accusative case ; as, *citratem calcis lava*—wash the citrate of lime.

(b) The following prepositions govern the Accusative :—

Ad.....	To, at, for.	*Inter*.....	Between, among.
Adversum, adversus.....	Against, Towards.	*Ob*.....	On account of.
Ante.....	Before.	*Per*.....	Through, by.
Apud.....	At, with.	*Pone*.....	Behind.
Circum.....	Around.	*Post*.....	After.
Contra.....	Against.	*Prope*.....	Near.
Extra.....	Outside.	*Secundum*	According to.
Infra.....	Below.	*Supra*	Above.

(c) The following prepositions govern the Ablative as well as the Accusative :—

In (ac.) Into; (ab.) in.
Sub (ac.) Under; (ab.) near. | *Subter* (ac. and ab.) Under.

Rule IX.

The Ablative received its name because it signifies ablation or separation, the sign of which is *from*.

(a) Cause, manner, means, instrument, time when, and place where, are put in the Ablative; as, *balneo arenæ*—in a bath of sand.

(b) *Opus* and *usus* are followed by an Ablative; as, *cibo opus est nobis*—we have need of food.

(c) The definite answer to the questions "when" or "how" is expressed by a noun or pronoun and a participle in the ablative case, and is called the Ablative absolute; as, *liquoribus omnibus mixtis*—all the liquors having been mixed.

The following prepositions govern the Ablative :—

A, ab, abs...	Away, from, by.	*Præ*.....	Before, because of.
Cum.....	With.	*Pro*.....	For, before, according to.
De.....	Down, from, of, about.		
E, ex.....	Out of, from, after.	*Sine*.....	Without.

(d) *Utor*, *abutor*, and a few other verbs govern the Ablative; as, *utatur sequenti*—let him use the following.

Rule X.

The Imperative mood is used to express requests or commands; as, *Recipe*—Take (thou).

(a) The Present Subjunctive mood is often used instead of the Imperative; as, *fiat mistura*—let the mixture be made.

LATIN WORDS AND PHRASES MOST FREQUENTLY USED IN PRESCRIPTIONS FULLY EXPLAINED.*

Aa, Ana (Greek preposition) of each.
A, Ab, prep. by or from (governs abl.)
Ad 3tiam vicem = ad tertiam vicem. For three times.
Ad lib. = ad libitum. (*ac., s., libitus-i. Rule* viii.) At pleasure.
Add. = Adde, *im, m.* (*addo, -didi, -ditum, -ere.*) Add.
Admov. = Admove, *im, m.* (*Admoveo, -vi, -tum, -ere.*) Apply.
Æger, ægra, ægrum, *adj.* Sick. (The patient.)
Albus (*-us, -a, -um, adj.*) White.
A. H., Alternis Horis. (*ab. pl. Rule* ix.) Every other hour.
Alvus (*-i, n. fem.*) The bowels.
Alvo Adst. = Alvo Adstrictâ. The bowels being confined.
Amplus (*-us, -a, -um, adj.*) Large.
App. = Applicandum. (*-us, -a, -um, gerundive.*) To be applied.
Aq. = Aqua. (*-æ, n. f.*) Water.

Aq. Bull. = Aqua	Bulliens.	(*-entis, adj.*)	Boiling	water.
„ **Com.** = „	Communis.	(*-is, -e, adj.*)	Common	„
„ **Dest.** = „	Destillata.	(*-us, -a, -um, adj.*)	Distilled	„
„ **Ferv.** = „	Fervens.	(*-entis, adj.*)	Hot	„
„ **Font.** = „	Fontalis.	(*-is, -e, adj.*)	Spring	„
„ **Mar.** = „	Marina.	(*-us, -a, -um, adj.*)	Sea	„
„ **Niv.** = „	Nivalis.	(*-is, -e, adj.*)	Snow	„
„ **Pluv.** = „	Pluvialis.	(*-is, -e, adj.*)	Rain	„

Auris (*-is, n. f.*) The ear.
Aut (*conj.*) Or.
Balneum (*-ei, n, neu.*) A bath.
Bene (*adv.*) Well.
Bibo (*bibere v. 3rd conj.*) To drink.
Bis Ind. = Bis Indies. (*adv.*) Twice a day.
B. P. or **Ph. B.** = Pharmacopœia Britannica, British Pharmacopœia.
Brachium (*-ii. n. neu.*) The arm.
C. = Cum. (*prep. gov. abl. See Rule* ix). With.
Calidus (*-us, -a, -um, adj.*) Warm.
Calor (*-oris, n. masc.*) Heat.
Capio (See **Cpt.**) To take.
Caput (*-itis, n. neu.*) The head.
Cataplasma (*-atis, n. neu.*) A poultice.

* Abbreviations Used.—*ab.*, or *abl.*, ablative ; *ac.*, accusative ; *ad.*, or *adj.*, adjective ; *adv.*, adverb ; *conj.*, conjunction ; *f.*, feminine ; *gen.*, genitive ; *im.*, or *imp.*, imperative ; *indec.*, indeclinable ; *indef.*, indefinite ; *irr.*, irregular ; *m.*, or *masc.*, masculine ; *m.*, or *mo.*, mood ; *n.*, or *no.*, noun, *nom.*, or *no.*, nominative ; *num.*, numeral ; *neu.* neuter ; *pas.*, passive ; *part.*, participle ; *p., pr.*, or *pres.*, present ; *pl.*, plural ; *prep.*, preposition ; *pron.*, pronoun ; *s.*, singular ; *sub.*, subjunctive ; *t.*, tense ; *tr.*, transitive ; *v.*, verb.

Ceratum (*-i, n. neu.*) An ointment or cerate.
Charta (*-æ, n. f.*) A powder or a paper.
Cibus (*-i. n. masc.*) Food.
Circa (*prep. gov. accus.*) Around.
Coch.=Cochlear, Cochleare, or Cochlearium. (*n. neu.*) A spoonful.
Coch. Amp. = Cochlear (*-aris*) Amplum. (*-us, -a, -um, adj.*) A table-spoonful.
„ **Mag.** = Cochlear (*-aris*) Magnum. (*-us, -a, -um, adj.*) A large spoonful; or a table-spoonful.
„ **Med** = Cochlear (*-aris*) Medium or Modicum. (*-us -a, -um, adj.*) A dessert-spoonful.
„ **Min.** = Cochlear (*-aris*) Minimum. (*-us, -a, -um, adj.*) A small tea-spoonful.
„ **Parv.** = Cochlear (*-aris*) Parvum. (*-us, -a, -um, adj.*) A tea-spoonful.
Cochleat. = Cochleatim. (*Adv.*) By spoonfuls.
Cœna (*-æ, n. f.*) Supper.
Coll. = Collyrium. (*-ii, n. neu.*) An eye-wash.
Colo (*-avi, -atum, -are, v. a.*) To strain.
Co. = Compositus. (*-us, -a, -um, adj.*) Compound.
Comp. = Compositus. (*-us, -a, -um, part.*) Compounded.
Confectio (*-onis, n. f.*) A confection or electuary.
Cong. = Congius. (*-ii, n. masc.*) A gallon.
Conserva (*-æ, n. f.*) A conserve or electuary.
Coq. = Coque. (*coquo, -xi, -ctum, -ere, v., im. m.*) Boil.
Cpt. = Capiat. (*pr. sub, 3rd per. s., capio, cepi, captum, capere. Rule* x.) Let the patient take.
Cras (*adv.*) To-morrow.
Crus (*Cruris, n. neu.*) The leg.
Cuj. = Cujus. (*gen. s. of qui, quæ, quod.*) Of which.
Cum (*prep. gov. abl.*) With.
Cyath. = Cyathus. (*-i, n. masc.*) A glass.
C. Vinar. = Cyathus Vinarius. A wine-glass.
D. = Dosis. (*Dosis, n. f.*) A dose.
Da / **Det.** = Da. (*do, dedi, datum, dare, imp. m.*, Give; / Detur. *pres. sub., 3rd p. s.*) Let it be given.
Decoctum (*-i., n. neu.*) A decoction.
Decub. = Decubitus. (*-us, -a, -um, part.*) Lying down.
De d. / **in d.** = De die (*-es, -ei, n. masc. ab. s. Rule* ix.) From day / in diem. *Rule* viii. to day.
Dej. / **Alv.** = Dejectiones (*-onum, n. pl.*) Stools, or motions / Alvi. (*-i, n. f. gen. s.*) of the bowel.
Dens (*dentis, n. m.*) A tooth.
Dexter (*-tra, -trum, adj.*). Right.
Dieb. alt. = Diebus (*-es, -ei, n. ab. pl. Rule* ix.) Every / Alternis. (*-us, -a, -um, adj. pl. ab. m. Rule* ii.) other day.

Digitus (*-i., n. m.*) A finger.
Dim. = Dimidius. (*-us, -a, -um, adj.*) One half.
Div. = Divide. (*-do, -visi, -visum, -dere, im. m.*) Divide.
Div. in p. Æq. = Dividatur (*-vido, -visi, -sum, -ere, v. 3rd per. s. prs. pass. sub.*) in partes (*n. ac. pl. gov. by in*) Æquales (*adj., agreeing with partes.*) — Let it be divided into parts equal.
Dolor (*-oris, n. masc.*) Pain.
Donec (*conj.*) Until.
Durant. Dolor. = Durante (*-ans, -antis, part.*) Dolore. (*-oris, n. masc.*) — While the pain lasts.
Dos. = Dosis. (*-is, accusative dosin, n. f.*) A dose.
Drachma (*-æ, n. f.*) A drachm.
Dulcis (*-is, -is, -e, adj.*) Sweet.
Dum (*adv.*) Whilst.
Duo (*duo, -æ, -o, adj.*) Two.
E or **Ex** (*prep. gov. abl.*) Out of.
Ejusd. = Ejusdem. (*idem, eadem, idem, gen. s.*) Of the same.
Effervescentia (*-æ, n. f.*) Effervescence.
Elect. = Electuarium. (*-ii. n. neu.*) An electuary.
Emesis (*-is, n. f.*) Vomiting.
Emplastrum (*-tri, n. neu.*) A plaster.
Enema (*-atis, n. neu.*) An enema or clyster.
Et (*conj.*) And.
Extractum (*-i, n. neu.*) An extract.
F. = Fac. (*facio, feci, factum, facere, imp. m., 2nd p. s.*) Make.
F.A.O. = Folio Argenti Obruantur. Let them be rolled in silver leaf.
Febris (*-is, n. f.*) Fever.
Febricula (*-æ, n. f.*) Fever.
Fer. = Ferrum. (*-i, n. neu.*) Iron.
Ferv. = Fervens. (*-ens, -entis, adj.*) Hot.
Flatus = (*-us, n. masc.*) Flatulence.
Flavus (*-us, a, -um, adj.*) Yellow.
Flos (*-oris, n. masc.*) A flower.
Fol. = Folium. (*-ii, n. neu.*) A leaf.
Frigidus (*-a, -um, adj.*) Cold.
Frequenter (*adv.*) Frequently.
Ft. = Fiat. (*fio, factus, fieri, pres. sub. 3rd s.*) Let it be made.
Ft. = Fiant. („ „ „ „ „ „ *pl.*) Let them be made.
Garg. = Gargarisma. (*-matis, n. neu.*) A gargle.
Genu (*-us, n. neu.*) The knee.
Gradatim (*adv.*) By degrees.
Gr. = Granum. (*-i, n. neu.*) A grain.
Gtt. = Gutta. (*-æ, n. f.*) A drop.
Guttat. = Guttatim. (*adv.*) By drops.
H. = Hora. (*-æ, n. f.*) An hour.

Haust.=Haustus. (*-us, n. masc.*) A draught.
Hebdomas (*-adis, n. f.*) A week.
Heri (*adv.*) Yesterday.
Hodie (*adv.*) To-day.
Hora (*-æ, n. f.*) An hour.
H.S.S.=Hora Somni Sumendum. To be taken at bed-hour.
Idem (*idem, eadem, idem, pron.*) The same.
In (*prep. gov. abl. or acc.*) In or into.
In d.=In-dies. (*adv.*) From day to day or daily.
Injectio (*-onis, n. f.*) An injection.
Infra (*prep. gov. acc.*) Below.
Infrico (*-cui, -ctum, and -catum, -are.*) To rub in.
Infusum (*-i. n. neu.*) An infusion.
Intime (*adv.*) Thoroughly.
Jecur (*jecoris, n. neu.*) The liver.
Latus (*-eris, n. neu.*) The side.
Laxativus (*-us, -a, -um, adj.*) Laxative.
Levis (*-is, -is, -e, adj.*) Light.
Libra (*-æ, n. f.*) A pound.
Lin.=Linimentum. (*-i, n. neu.*) A liniment.
Liquidus (*-us, -a, -um. adj.*) Liquid.
Liquor (*-oris, n. masc.*) A liquid.
Lytta (*-æ, n. f.*) Cantharides.
Lotio (*-onis, n. f.*) A lotion.
Macero (*-avi, -atum, -are.*) To macerate.
Mag.=Magnus. (*-us, -a, -um, adj.*) Large.
Mane (*indecl. neu. n.—used adverbially.*) In the morning.
Mane Primo (*adv.*) Very early in the morning.
M.=Massa. (*-æ, n. f.*) A mass.
M.=Misce (*misceo, miscui, mistum, miscere, pres. imper.*) Mix.
M. or **Min.**=Minimum (*-i, n. neu.*) A minim.
Med.=Medicamentum (*-i, n. neu.*) A medicine.
Medius (*-us, -a, -um, adj.*) Middle.
Mensura (*-æ, n. f.*) A measure or by measure.
Meridies (*-ei, n. masc.*) Mid-day or noon.
Mist.=Mistura (*-æ, n. f.*) A mixture.
Mitte (*mitto, misi, missum, mittere, 2nd p. s. pres. imper.*) Send.
Modicus (*-us, -a, -um, adj.*) Middle-sized.
Mol=Mollis (*-e, adj.*) Soft.
More dict.=More dicto. (*more, mos, -ris, n. masc.; dicto, dico, xi, -ctum, -ere, participle.*) In the manner directed.
M.D.U.=More dicto utendum (*utendus, -a, -um; gerundive of utor.*) To be used as directed.
More Sol.=More solito (*solitus sum, solere, v. neu. passive.* To be accustomed.) In the usual manner.
Morbus (*-i, n. masc.*) Disease.
M.P.=Massa Pilularis. A pill mass.

Nig.=Niger (*-ra, -rum, adj.*) Black.
Nisi (*conj.*) Unless.
Nox (*noctis, n. f.*) Night.
N.P.=Nomen Proprium. The proper name.
Nux (*nucis, n. f.*). A nut.
Octarius (*-ii, n. masc.*) A pint.
Oculus (*-i, n. masc.*) An eye.
Oleum (*-ei, n. neu.*) Oil.
Om.=Omnis (*-is, -is, -e, adj.*) All ; every.
Omn. Hor.=Omni Hora. (*-æ, n. f.*) Every hour.
Omn. Quadr. Hor.=Omni Quadrante Horæ. (*Quadrans, -tis, ab. f.*) Every quarter of an hour.
Ope (*ops, opis, n. f. ab. s.*) *Rule* ix. (*a*) By the aid of.
Optimus (*-us, -a, -um, adj.*) Best.
Opus (*indeclinable n. neu.*) Need or occasion.
Pars (*-tis, n. f.*) A part.
P. Æ.=Partes Æquales (*-is, -is, -e, adj.*) Equal parts.
Parvulus (*-us, -a, -um, adj.*) Very little.
Paul.=Paululus. (*-us, -a, -um, adj.*) Little.
Parvus (*-us, -a, -um, adj.*) Little ; small.
Pectus (*-oris, n. neu.*) The breast.
Per (*prep. governs acc.*) Through.
Pes (*pedis, n. masc.*) The foot.
Pil.=Pilula (*-æ, n. f.*) A pill.
Pocul.=Poculum (*-i, n. neu.*) A cup ; a little cup.
Pollex (*-icis, n. masc.*) Thumb.
Pone (*prep. gov. acc.*) Behind.
Post (*prep. gov. acc.*) After.
Postea (*adv.*) Afterwards.
Post singulas dejectiones liquidas. After each loose motion.
P.P.A.=Phiala prius agitata—(*ablative absolute.*) The bottle having been first shaken.
Prandium (*-ii, n. neu.*) Dinner.
Primus (*-us, -a, -um, adj.*) First.
P.R.N.=Pro re nata (*adverbial phrase.*) Occasionally, or according to circumstances.
Pro (*prep. gov. abl.*) Before.
Pulmo (*-onis, n. masc.*) A lung.
Pulv.=Pulvis (*-veris, n. masc.*) A powder.
Q.Q.=Quaque *f.* or Quoque *masc.* (*quisque, quæque, quodque, abl. s. indef. prn.*) Each or every.
Q.S. =Quantum (*adv.*) As much as
=Sufficiat. (*sufficio, -feci, -fectum, -ere.*) is sufficient.
Quaque Hora (*abl. of quisque, quæque, quodque, pron.*) Each hour.
Quartus (*-us, -a, -um, adj.*) Fourth.
Quintus (*-us, -a, -um, adj.*) Fifth.
Quor.=Quorum (*qui, quæ, quod, pron.*) Of which.

Quater (*adv.*) Four times.
Quibus (*qui, quæ, quod, rel. pron. ab. pl.*) From which.
Quotidie (*adv.*) Daily.
R.=Recipe (*recipio, recepi, receptum, recipere, im. m.*) Take thou.
Rad.=Radix (*-icis, n. f.*) A root.
Rec.=Recens (*-ens, -ens, -ens, adj.*) Fresh.
Repet. { Repetatur (*repeto, -ivi, -itum, -ere, sub. m. 3rd s.*) } Let it be repeated. { Repetantur (*3rd pl.*) } Let them be repeated.
S.A.=Secundum Artem (*secundum, prep; ars, artis, n. f.*) According to Art.
Sæpe (*adv.*) Often.
Scrupulus (*-i, n. masc.*) A scruple.
Secundus (*-us, -a, -um, adj.*) Second.
Sem.=Semen (*-inis, n. neu.*) Seed.
Semiuncia (*-æ, n. f.*) A half-ounce.
Separatim (*adv.*) Separately.
Sesquih.=Sesquihora (*sesquihora, -æ, n. f.*) An hour and a half.
Sextus (*-us, -a -um, adj.*) Sixth.
Si (*conj.*) If.
Sig.=Signa (*signo, -avi, -atum, -are, im. m.*) Mark thou.
Simul (*adv.*) Together; at the same time.
Sine (*prep.*) Without (*gov. abl.*)
Sing.=Singulorum (*singulus, -a, -um, adj.*) Of each.
Si op. sit=Si opus sit. If necessary.
Sit (*sum, fui, esse, p. sub.*) Let it be.
S.N.=Secundum Naturam (*-a, -æ, n. f.*) According to nature.
Solve (*solvo, solvi, solutum, solvere.*) Dissolve.
Somnus (*-i, n. masc.*) Sleep.
Spt.=Spiritus (*-us, n. masc.*) Spirit.
Ss.=Semis (*-is, -issis, n. masc.*) A half.
S.S.=Statim Sumendum. To be taken immediately.
St.=Sumat (*sumo, sumpsi, sumptum, sumere, pr. sub.*) Let him take.
Stat.=Statim (*adv.*) Immediately.
Sub (*prep. gov. acc. or abl.*) Under.
Subinde (*adv.*) Frequently.
Suc.=Succus (*-i, n. masc.*) Juice.
Sum.=Sume (*sumo, sumpsi, sumptum, sumere, im. m.*) Take.
Super (*prep. gov. acc. or abl.*) Over.
Supra (*prep. gov. acc.*) Above.
Syrupus (*-i, n. masc.*) Syrup.
Talis (*talis, talis, tale, adj.*) Such.
Ter (*adv.*) Thrice.
Tere (*tero, trivi, tritum, terere, im. m.*) Rub.
Tertius (*-us, -a, -um, adj.*) Third.

Thorax (*-acis, n. masc.*) The chest.
Tr. or **Tinct.**=Tinctura (*-æ, n. f.*) A tincture.
Trit.=Tritura (*trituro, triturare, im. m.*) Triturate ; grind.
Tussis (*-is, n. f.*) A cough.
Una (*adv.*) Together.
Uncia (*-æ, n. f.*) An ounce.
Ungt.=Unguentum (*-i, n. neu.*) An ointment.
Unus (*-a, -um, adj.*) One.
Ut Dict. ſ =Ut Dictum. As directed.
Utend. ł =Utendum (*-us, -a, -um, gerundive.*) To be used.
Vac. Ven.=Vacuo Ventriculo (*adj. & n., ab. sing.*) *Rue* ix. (*a.*) On an empty stomach.
Vel (*conj.*) Or.
Vena (*-æ, n. f.*) A vein.
Venenum (*-i, n. neu.*) Poison.
Ver.=Verus (*-us, -a, -um, adj.*) Genuine.
Vesicatorius (*-us, -a, -um, adj.*) Blistering.
Vesp.=Vesper (*-eris, n. masc.*) The evening.
Vetus (*-us, -us, -us, adj.*) Old.
Vices (*n. f. defective.*) Time.
Viginti (*numeral adj. indec.*) Twenty.
Vinum (*-i, n. neu.*) Wine.
Virus (*-i. n. neu.*) Poison.
Vitellus (*-i, n. masc.*) Yolk (*i.e.* of egg.)
Vomicus (*-us, -a, -um, adj.*) Nauseating.
Vomitus (*-us, n. masc.*) A vomit.
Vulnus (*-eris, n. neu.*) A wound.

SPECIMEN PRESCRIPTION.

The accompanying recipe may be taken as a sample of a physician's prescription, and the student will do well to carefully study the various contractions and compare them with the Latin words which they represent upon the succeeding page. It is hardly necessary to insist upon the absolute necessity of writing all prescriptions in the most legible handwriting. Carelessness, which is generally the cause of illegibility, is in this department of therapeutics unpardonable.

Mr. Browne, Holywood.

℞.

Liq. Strych. Hyd. ℥j.
Ac. N-Hyd. D. ℥vl.
Syr. Aromat. ℥ij.
Inf. Aurantii ad ℥viij. (m.)
Ft. mist. cpt. coch. med. 3r
in die ex cyc. Vin. aqs. a. cib.

℞. Ext. Aloes Barb. Gr. ij.
Fer. Sulph. Exc. Gr. i.
Ext. Nuc. Vom. Gr. ß. (m.)
Ft. pil. mitte tales xxiv. ℥j a.a.
st. i. om. vesp. ante prand.

Mitte Emp. Vesic. H. f. r m.

1/4/98.

W.W.

MR. BROWNE, HOLYWOOD.

Recipe

Liquoris Strychninæ Hydrochloridi, drachmam unam.
Acidi Nitro-Hydrochlorici Diluti, drachmas sex.
Syrupi Aromatici, unciam cum semisse.
Infusi Aurantii, ad uncias octo.

Misce.

Fiat mistura. Capiat cochleare medium ter in die ex cyatho vinario aquæ ante cibos.

Recipe

Extracti Aloes Barbadensis, granum cum semisse.
Ferri Sulphatis Exsiccati, granum unum.
Extracti Nucis Vomicæ, semigranum.

Misce.

Fiat pilula. Mitte tales viginti quatuor. Folio argenti obruantur. Sumat unam omni vespere ante prandium.

Mitte Emplastrum Vesicatorium hujus formæ et magnitudinis.

W. W.

1/4/98.

Take of
Solution of Hydrochloride of Strychnine, one drachm.
Diluted Nitro-Hydrochloric Acid, six drachms.
Aromatic Syrup, one ounce and a half.
Infusion of Orange, to eight ounces.

Mix.

Make a mixture. Take one dessert-spoonful three times a day in a wine-glass of water before meals.

Take of
Extract of Barbados Aloes, one grain and a half.
Dried Sulphate of Iron, one grain.
Extract of Nux Vomica, half a grain.

Mix.

Make a pill. Send twenty-four such. Let them be rolled in silver leaf.
Take one every evening before dinner.

Send a blister of this shape and size.

W. W.

1/4/98.

GROUPS OF THERAPEUTIC AGENTS.

As the *junior* student will be frequently meeting in the Materia Medica portion of this work with words whose meaning he cannot understand, the following brief glossary is inserted here, not as an attempt to classify remedies, but merely for facility of reference, in order to explain terms in constant use which apply to many groups of well-known remedies.

There are *two* well-recognised and often-mentioned effects of a remedy—the Physiological and the Therapeutical—and the student should be familiar with both these terms.

By the Physiological action of a medicine is generally meant the effects which the medicine will produce when administered to a person in *health;* though it should be remembered that to produce these effects a perfectly healthy state is not *necessary*. Thus, if 10 or 20 grs. of quinine be administered to a perfectly healthy subject, the constitutional effect of the remedy soon shows itself in the characteristic group of symptoms called cinchonism. This is spoken of as the Physiological or Primary action of quinine. If a medicinal dose of this drug be administered to a patient ill with the ague or neuralgia, it will be found to remove the disease; this is the Therapeutical or Secondary effect of the remedy. Suppose, however, the dose be a very large one, as in the first instance, the remedy may produce cinchonism, even though the patient have ague or neuralgia, and in this case the effects would still be called Physiological. It will thus be understood that, in administering a remedy in disease, the physician often desires it to be given in such a quantity that the *Physiological* effects of the drug should be made evident, as in treating syphilis with mercury, chorea with arsenic, paralysis with strychnine, or pertussis with belladonna.

To discuss the different theories which have from time to time prevailed about the way in which medicines produce their effects in the system, is beyond the intention of a short work like this. Under the name of each drug, in the Therapeutical part of this book, will be found a description of the way in which each is known or supposed to act. It will be hardly necessary to remind the student that the great bulk of remedies, after being swallowed, speedily find their way into the circulating fluid, accelerated or retarded by their crystalloid or colloid nature, and the well-known laws of osmosis. By the blood they are carried to the different tissues or glands, upon which they produce their characteristic effects, and by which, in many instances, they are eliminated or thrown out of the body. Why they exercise their peculiar selective power over these particular tissues and organs is a question which, with our present knowledge, we can hardly attempt to explain.

There are several terms constantly employed in the description of the actions of drugs which are unfortunately used in different senses by different writers. The *local* or *direct* action of a drug is seen in the case of swallowing a corrosive poison which injures the mucous lining of the stomach. Its *remote* or *indirect* action would be seen in the stoppage of the heart which might result from its *secondary* influence upon the nerves and circulation. The *primary* or *immediate* action of a dose of croton oil would be to clear out the intestinal canal, its *secondary* or *remote* action might be to remove dropsical effusion in the brain or cellular tissue, or to relieve uræmia.

Acids—Though these are always regarded as a group of remedies belonging to a chemical classification, the recent additions to our knowledge of the effects of acid substances justify the mention of them as a group in a Therapeutical list. They are medicines which, in the concentrated form, act mostly as caustics, and when given in medicinal doses possess the power of *checking the acid secretions* of the body with which they come in contact, and, at the same time, they directly *increase alkaline secretions*. It is by this theory that Ringer explains their use in acid dyspepsia, sweating, &c. The principal members of the group are hydrochloric, acetic, nitric, sulphuric, phosphoric, nitro-hydrochloric, and citric acids.

Alkalies or Antacids—Under this head are included substances which have the power of *checking alkaline* and stimulating or *increasing acid secretions*. The most important are—caustic soda and potash, with their carbonates, bicarbonates, acetates, and citrates; ammonia and magnesia, with their preparations. Of this class, there are those which act *directly*, as soda does upon the gastric membrane, and those which also act *indirectly* through the blood.

Alteratives are a class of remedies which, when administered, cure disease without producing any obvious impression on any of the organs of the body; and because the way in which they act is not understood, or capable of demonstration, in the present state of our ignorance, they are said to *alter* the morbid processes, and hence are called "Alteratives." The most important of this class are antimony, mercury, arsenic, iodine, colchicum, and their preparations.

Anaphrodisiacs are medicines which weaken the sexual functions, as camphor, bromides of ammonium and potassium, tobacco, hemlock, iodides of sodium and potassium.

Anæsthetics are medicines which produce loss of sensation and consciousness from their effects upon the brain and spinal centres. The term is usually restricted to volatile substances,

like chloroform, ether, bromoform, nitrous oxide gas, &c., and does not include narcotics like alcohol and opium, which likewise produce anæsthesia.

Anæsthetics *(Local)* are agents which, when applied directly to a part, destroy its sensibility by their action on the sensory nerves, without injuring the tissues—as ether in the form of spray, cocaine, carbolic acid, ice, veratrine, &c.

Analgesics or Anodynes are remedies which relieve pain by their action on the brain, or their influence over the conductivity of the sensory nerve fibre, as opium, Indian hemp, belladonna, aconite, chloroform, antifebrin, antipyrine, &c.

Anhidrotics are medicines which restrain profuse perspiration. They act by (1) paralysing the terminals of the nerves going to the sweat glands, or (2) by their influence upon the gland cells, or (3) upon the sweat centres, or (4) the circulation, as belladonna, atropine, hyoscyamus, stramonium, muscarine, quinine, zinc salts, the vegetable and mineral astringents, and picrotoxin in small doses.

Antacids. (See Alkalies).

Anthelmintics, Vermifuges or Antiscolics are medicines which destroy or cause the expulsion of worms, as santonin for the *round* worm, kousso, kamala, male-fern, turpentine, areca nut, and pomegranate for the *tape* and *broad* worms, and injections of salt, tannin, quassia, alum, iron, lime water, &c., for the *thread* worm.

Antagonists are medicines which act in direct opposition to each other, as atropine and muscarine ; atropine and hydrocyanic acid ; atropine and physostigmine ; atropine and pilocarpine ; digitalin and saponin ; chloral and strychnine ; opium and belladonna ; alcohol and strychnine.

Antidotes are medicines that relieve or remove the symptoms caused by poisons. Antidotes are *chemical*, as lime for sulphuric acid ; *physiological*, as strychnine for woorara ; or *vital*, as mercury for syphilis.

Antilithics or Lithontriptics are medicines supposed to possess the power of dissolving various concretions in the body, as the acids for phosphatic, and the alkalies for uric acid calculi ; and Castile soap and salicylate of soda for gall-stones.

Antiparasitics are medicines which destroy minute parasites—as sulphurous and carbolic acids, iodide of sulphur, and various mercurial salts, and the innumerable list of antiseptics.

Antiperiodics are medicines which antagonise the poison of periodic disorders like ague. The principal members of the group are quinine, arsenic, iodine, and beberine.

Antiphilogistics are remedies which are supposed to possess the power of subduing inflammations—as mercury, aconite, veratrum viride, purgatives, antimony, venesection, &c.

Antiseptics are medicines which prevent putrefaction by destroying or arresting the growth and development of the germs, upon whose presence putrefaction depends. Carbolic acid may be taken as the type of this class. They should not be confounded with Disinfectants like hot air, which destroy the germs causing disease, or with Deodorants like chlorine or charcoal, which destroy fetid smells and emanations.

Antisialics are remedies used to diminish or check the secretions of the salivary glands, as atropine, and physostigma in large doses.

Antipyretics are remedies which reduce the temperature in fevers and diseased conditions. They do so either (1) by lessening the production of heat, through their effect on the nervous system, as antipyrine, antifebrin, quinine, salicin, &c., or (2) by destroying the poison which causes the fever, as arsenic and iodine in ague, or (3) by their action on the skin or circulation, as alcohol, antimony, aconite, &c., or (4) they may act by extracting the heat, as the cold bath and diaphoretics and sudorifics do.

Antispasmodics—Several distinct groups of remedies are included under this heading.

(1) Medicines which *paralyse* the motor centres, as Calabar bean and woorara, or which merely *depress* them, as bromides of potassium and ammonium.

(2) Medicines which produce profound general depression of all the vital functions, as tobacco, aconite, lobelia, hellebore, Prussic acid ; and many remedies called sedatives.

(3) Medicines which, by stimulating the bowel, cause the expulsion of gas and relieve colic, as asafetida, cajuput, castor, valerian, and a host of remedies called Carminatives and Aromatics.

(4) Medicines which overcome spasm of the bronchial tubes, as stramonium, belladonna, hyoscyamus, &c.

Aphrodisiacs are medicines which increase the sexual appetite and excite the functions of the genital organs, as phosphorus, cantharides, strychnine, damiana, cannabis indica, &c. They act directly upon the genital nerve centres in the cord and brain, as strychnine, or indirectly by irritating the bladder and urethra, as cantharides.

Astringents are remedies which cause contraction of muscular fibre, and condensation of the tissues, mostly by

precipitation of gelatin and albumen. The most important are tannic and gallic acids, and all substances containing them, the mineral acids, and most metallic salts, alum, creosote, &c.

Carminatives. (See Antispasmodics).

Cathartics, Aperients, Evacuants or Purgatives are medicines which increase or quicken the evacuations from the bowel. They are variously sub-divided :—

a. Laxatives, which slightly quicken the peristaltic movements, and cause only *softened* motions, as manna, sulphur, figs, prunes, olive oil, &c.

b. Purgatives proper or simple purgatives, which, by increasing the movements of the intestines, and stimulating the glands, cause *semi-fluid* motions, as senna, castor oil, mercurials, aloes, &c.

c. Drastics, which act like the former class, only more intensely, and by their local irritant action increase the intestinal fluid, and remove the serum from the intestinal vessels, causing *almost fluid* motions—as scammony, jalap, colocynth, gamboge, podophyllin, and large doses of class *b*.

d. Hydragogues, which cause *free* secretion from the intestinal glands, and remove much serum from the blood vessels, producing *fluid* or *watery* motions, as croton oil, elaterin, and many of the remedies in class *c ;* and large doses of various salts, like cream of tartar, Epsom, Glauber, &c., which are often called *saline* purgatives, and which are supposed to act by virtue of their low diffusive powers.

e. Cholagogue Purgatives are remedies which are supposed to purge by stimulating the liver and increasing the bile, or by concentrating their action upon the duodenum they cause the bile to be swept out of the body before it has time to be re-absorbed by the intestinal surface (calomel and podophyllin) ; they produce *greenish liquid* motions ; most brisk purgatives are included in this class by writers, as aloes, iridin, mercurials, rhubarb, euonymin, &c.

Cholagogues. (See Cathartics.) The term is sometimes used to include such mild hepatic stimulants as the dilute nitro-hydrochloric acid, soda salts, and the chloride of ammonium.

Ciliary Excitants are medicines which, when sucked in the mouth, promote expectoration of bronchial mucus by reflex action —as chloride of ammonium, chlorate of potassium, gum acacia, native chloride of sodium, &c.

Counter-Irritants—Under this heading are included—RUBEFACIENTS, remedies which cause redness of the skin ; EPISPASTICS, or VESICANTS, which produce inflammation, ending in the formation of a blister ; REVULSIVES and DERIVATIVES, remedies which are supposed to remove the diseased action from

the seat of mischief to the place of their application. Amongst this class are cantharides, turpentine, ammonia, camphor, mustard, most volatile oils, mezereon, capsicum, croton oil, &c.

Demulcents are medicines which protect the parts with which they come in contact, by their oleaginous or mucilaginous qualities, shielding them from irritating secretions. Linseed, olive, and almond oils, starch, glycerin, liquorice, &c., are included under this head.

Diaphoretics are medicines which increase the cutaneous secretion, either by stimulating the terminal nerves in the cells of the sweat glands, as pilocarpine does, or by causing the dilatation of the superficial capillaries, as antimony, ipecacuanha, and all depressing remedies ; or by stimulating the sweat centres in the spinal cord, as the spirit of nitrous ether.

Diluents are remedies like water and weak fluid foods, which, when taken in quantity, on being eliminated, carry out some solids with them by the kidneys, lungs, or skin.

Disinfectants and **Deodorants** are referred to under Antiseptics.

Diuretics are remedies which increase the renal secretion. *Stimulating diuretics* act by stimulating the kidneys during their elimination, as copaiba, cubebs, turpentine, pepper, gin, alcoholic liquors, buchu, cantharides, juniper, &c. *Hydragogue diuretics* act by raising the blood pressure in the glomeruli, as digitalis, squill, casca, broom, caffeine, &c. *Refrigerant diuretics* act by washing out the kidneys, as large doses of diluents, like water, and solutions of the various potash salts.

Ecbolics are medicines which cause contraction of the uterine muscular fibre, as ergot, borax, savin, quinine, &c. ; in smaller doses they are emmenagogue.

Emetics are medicines which cause the evacuation of the contents of the stomach. They are divided into (1) *Local* Emetics, as zinc and copper sulphates, mustard, carbonate of ammonia, warm chamomile infusion, and solution of common salt, alum, &c., which act locally by irritating directly the nerves distributed to the gastric mucous membrane. (2) *General* Emetics, which act through the blood upon the vomiting centre, as tartar emetic, ipecacuanha, senega, squill, and apomorphine. Most of these latter drugs are eliminated by the gastric mucous membrane after absorption, and then also act partly as local emetics. Apomorphine may, however, be regarded as a pure general emetic.

Emmenagogues are medicines which, by their stimulating action on the uterine fibre (1) directly assist in restoring

disordered menstruation, as ergot, savin, and most ecbolics ; or (2) by removing the cause of the suppression, allow the discharge to return, as iron, aloes, strychnine, &c.

Emollients or Protectives are external Demulcents, which protect and soothe the parts to which they are applied from all sources of irritation ; or, by their oily nature, they help to relax and soften the tissues, as hot fomentations, poultices, oils, lard, spermaceti, chalk, starch, &c.

Errhines are medicines which increase the secretion of the nasal mucous membrane generally without causing sneezing, as the vapour of ammonia, acetic acid, &c. The term is, however, often applied also to sternutatories.

Escharotics or Caustics are substances which destroy the life of the tissue to which they are applied, generally by depriving it of its moisture—as the strong mineral acids, soda, potash, lime, arsenic, chloride of zinc, &c.

Expectorants are medicines which assist the expulsion of the bronchial mucus—

(1) By relieving spasm of the bronchial tubes, as lobelia, opium, stramonium, tobacco, &c.

(2) By mechanically dislodging it in the act of vomiting, at the same time thinning the secretion, as all emetics *in large doses*, notably antimony, hippo, &c.

(3) By increasing the flow from the inflamed membrane, through their effects upon its gland cells, as all the emetic class *in small doses—Nauseating* or *Depressant* expectorants—as apomorphine, pilocarpine, emetine, and tartar emetic.

(4) By stimulating the membrane in the act of their elimination, they so alter the secretion that expectoration is rendered easy, as ammonia, senega, ammoniacum, and a host of volatile substances, notably the onion, tar, turpentine, balsams, asafetida, &c.—*Stimulating* expectorants. Iodide of potassium, by liquefying the secretion, is a valuable expectorant.

(5) By soothing the irritable respiratory centre, morphine and chloral may act as expectorants, and render the expulsion painless.

(6) By acting through the impression produced on the nerves of the mouth, many substances aid expectoration. (See Ciliary excitants).

(7) By stimulating the respiratory centre, and strengthening the muscles of the expulsive mechanism, strychnine and atropine may act as true expectorants.

Galactagogues are medicines which increase the secretion of the mammary glands, as chlorate of potassium, fennel &c.

Hæmatics or Hæmatinics are medicines which enrich the blood by acting as restoratives to the red corpuscles, as iron and its preparations, manganese, cod liver oil, free phosphorus and lime phosphates, and potassium in small doses. They are also termed Blood Tonics.

Hypnotics or Soporifics are medicines which induce sleep without causing any previous cerebral excitement. Sulphonal, chloral, paraldehyde, urethane, and the new sleep producers belong to this class.

Mydriatics are remedies which cause dilatation of the pupil, paralysis of the ciliary muscle, and temporary loss of accommodation, as atropine, duboisine, belladonna, homatropine, daturine, &c.; they are generally used for their local action.

Myotics are remedies which cause contraction of the pupil and diminution of ocular tension, as eserine, Calabar bean, pilocarpine, &c.

Narcotics are medicines which produce sleep by their action upon the cerebrum. They are to be distinguished by their initial exciting stage from pure Hypnotics, like chloral and bromide of potassium, &c.; amongst them are opium, morphine, chloroform, Indian hemp, alcohol, and ether.

Refrigerants are medicines which reduce the temperature of the body in fever; the term, however, is generally applied to a class of remedies which appear to allay thirst, as the vegetable acids, some mineral acids (much diluted), and many diaphoretics. (See Antipyretics.)

Resolvents or Discutients are medicines which are supposed to cause the absorption of inflammatory or other swellings. They appear to act by stimulating the lymphatics, as iodine, cadmium, &c.

Restoratives are medicines which exist already in the healthy blood or tissues, and are given in diseases where the system is supposed to be deficient in them, as iron, potash, phosphorus, chloride of sodium, &c. They are identical with Hæmatinics (which see).

Rubefacients. (See Counter-irritants.)

Sedatives or Depressants are medicines which depress the action of the (1) nervous system, as tobacco, lobelia, bromide of potassium, &c.; (2) the circulatory system, as aconite, veratrum, Prussic acid, &c.; (3) the spinal cord, as Calabar bean, &c.

Sialagogues are medicines which increase the secretion of the salivary glands, either by a local irritation of the mouth,

causing reflex activity of the glands, as pellitory, mezereon, tobacco, mustard, capsicum, &c.; or by exciting the glands during their elimination, as pilocarpine, muscarine, all the preparations of mercury, iodide of potassium, &c.

Sternutatories are substances which, by their local irritating action on the nasal mucous membrane, cause sneezing, as tobacco, hellebore, ginger, capsicum, and ipecacuanha, in powder.

Stimulants*—Under this head may be included a great number of remedial agents. The sub-divisions are vague and misleading; thus there are medicines which excite the spinal cord, as strychnine, phosphorus, &c.; such are called spinal stimulants; others exalt the functions of the liver, as cholagogues; others the intestines, as calomel, Epsom salt, &c.; others the circulatory system, as digitalis, belladonna, &c.; others the stomach, as carminatives, like spices, &c.; others the skin. These latter are called external stimulants, and include all the Counter-irritants.

Stomachics are medicines which increase the vascularity of the stomach, promote digestion, and increase the appetite, as hippo, all the bitter tonics, arsenic, and aloes in small doses, &c.

Styptics are medicines which arrest bleeding by their local astringent action, either by causing coagulation of the blood, or by acting on the muscular tissue of the small vessels. Amongst this class will be found tannic acid, creosote, alum, chloride of zinc, perchloride of iron, &c.

Sudorifics. (See Diaphoretics).

Tonics are, strictly speaking, medicines which improve the tone of the part upon which they act; thus it may be on the stomach, as the pure vegetable bitters and all stomachics; or on the cord, as strychnine; or on the heart, as digitalis; or on the nervous system, as quinine and the valerianates; or on the muscular tissues, as tannic acid; or on the circulating fluid, as iron.

Vermicides and Vermifuges. (See under Anthelmintics). The term vermicide is sometimes restricted to a drug which causes the death of the worm, while vermifuge is applied sometimes to any drug which causes the expulsion of the worm, though it may not have power to cause its death.

Vesicants. (See Counter-irritants.)

* The term "Stimulants" is frequently erroneously used as a synonym for alcohol and its preparations, which are true narcotics.

PART III.

MATERIA MEDICA.

CHEMICAL REACTIONS OF THE OFFICIAL REMEDIES.

Acetanilidum (C_8H_9NO, or, C_6H_5NH,C_2H_3O).

$$\underset{\text{Acetic Acid}}{HC_2H_3O_2} + \underset{\text{Aniline}}{C_6H_5NH_2} = \underset{\text{Antifebrin}}{C_6H_5NH,C_2H_3O} + \underset{\text{Water}}{H_2O}$$

Acid. Aceticum and Acid. Acet. Glac. ($HC_2H_3O_2$).

$$\underset{\text{Sodium Acetate}}{NaC_2H_3O_2} + \underset{\text{Sulphuric Acid}}{H_2SO_4} = \underset{\text{Acid Sodium Sulphate}}{NaHSO_4} + \underset{\text{Acetic Acid}}{HC_2H_3O_2}$$

Acid. Boricum (H_3BO_3).

$$\underset{\text{Borax}}{Na_2B_4O_7 10H_2O} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} = \underset{\text{Boric Acid}}{4H_3BO_3} + \underset{\text{Acid Sodium Sulphate}}{2NaHSO_4} + \underset{\text{Water}}{5H_2O}$$

Acid. Carbolicum (HC_6H_5O).

$$\underset{\text{Carbolic Acid (Coal Tar Oil)}}{HC_6H_5O} + \underset{\text{Caustic Potash}}{KHO} = \underset{\text{Pot. Carbolate}}{KC_6H_5O} + \underset{\text{Water}}{H_2O}$$

$$\underset{\text{Pot. Carbolate}}{KC_6H_5O} + \underset{\text{Acid. Hydroch.}}{HCl} = \underset{\text{Acid. Carbolic.}}{HC_6H_5O} + \underset{\text{Pot. Chloride}}{KCl}$$

Acid. Chromicum (CrO_3).

$$\underset{\text{Bichromate of Potassium}}{K_2Cr_2O_7} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} = \underset{\text{Chromic Acid}}{2CrO_3} + \underset{\text{Acid Sulphate of Potassium}}{2KHSO_4} + \underset{\text{Water}}{H_2O}$$

Acid. Citricum ($H_3C_6H_5O_7,H_2O$).

$$\underset{\substack{\text{Citric Acid}\\\text{(Lemon Juice)}}}{2H_3C_6H_5O_7} + \underset{\substack{\text{Calcium}\\\text{Carb}}}{3CaCO_3} = \underset{\text{Calcium Citrate}}{Ca_3 2C_6H_5O_7} + \underset{\text{Water}}{3H_2O} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas}}}{3CO_2}$$

$$\underset{\text{Calcium Citrate}}{Ca_3 2C_6H_5O_7} + \underset{\substack{\text{Sulphuric}\\\text{Acid}}}{3H_2SO_4} = \underset{\text{Citric Acid}}{2H_3C_6H_5O_7} + \underset{\substack{\text{Calcium}\\\text{Sulphate}}}{3CaSO_4}$$

Acid. Gallicum ($H_3C_7H_3O_5H_2O$).

$$\underset{\substack{\text{Tannic Acid}\\\text{(Galls)}}}{C_{27}H_{22}O_{17}} + \underset{\text{Water}}{4H_2O} = \underset{\text{Gallic Acid}}{3H_3C_7H_3O_5} + \underset{\text{Glucose}}{C_6H_{12}O_6}$$

Acid. Hydrobromicum Dilutum (HBr).

$$\underset{\substack{\text{Sulphuretted}\\\text{Hydrogen}}}{2H_2S} + \underset{\text{Bromine}}{2Br_2} = \underset{\substack{\text{Hydrobromic}\\\text{Acid}}}{4HBr} + \underset{\text{Sulphur}}{S_2}$$

Acid. Hydrochloricum (HCl).

$$\underset{\substack{\text{Sodium}\\\text{Chloride}}}{NaCl} + \underset{\substack{\text{Sulphuric}\\\text{Acid}}}{H_2SO_4} = \underset{\substack{\text{Hydrochloric}\\\text{Acid}}}{HCl} + \underset{\substack{\text{Acid Sulphate}\\\text{of Sodium}}}{NaHSO_4}$$

Acid. Hydrocyanicum Dilutum (HCN).

$$\underset{\substack{\text{Pot. Ferro-}\\\text{cyanide}}}{2K_4FeC_6N_6} + \underset{\substack{\text{Acid.}\\\text{Sulph.}}}{6H_2SO_4} = \underset{\substack{\text{Acid.}\\\text{Hydrocyanic.}}}{6HCN} + \underset{\substack{\text{Acid Sulph.}\\\text{of Potassium}}}{6KHSO_4} + \underset{\text{Everett's Salt}}{FeK_2FeC_6N_6}$$

Acid. Lacticum ($HC_3H_5O_3$).

$$\underset{\text{Grape Sugar}}{C_6H_{12}O_6} = \underset{\text{Lactic Acid}}{2(HC_3H_5O_3)}$$

Acid. Nitricum (HNO_3).

$$\underset{\substack{\text{Potassium}\\\text{Nitrate}}}{KNO_3} + \underset{\substack{\text{Sulphuric}\\\text{Acid}}}{H_2SO_4} = \underset{\substack{\text{Nitric}\\\text{Acid}}}{HNO_3} + \underset{\substack{\text{Acid Sulphate}\\\text{of Potassium}}}{KHSO_4}$$

Acid. Nitro-Hydrochloricum Dilutum.

$$\underset{\text{Nitric Acid}}{2HNO_3} + \underset{\substack{\text{Hydrochloric}\\\text{Acid}}}{6HCl} = \underset{\substack{\text{Chloronitric}\\\text{Gas}}}{N_2O_2Cl_4} + \underset{\text{Water}}{4H_2O} + \underset{\text{Chlorine}}{Cl_2}$$

$$\underset{\text{Nitric Acid}}{HNO_3} + \underset{\substack{\text{Hydrochloric}\\\text{Acid}}}{3HCl} = \underset{\substack{\text{Chloronitrous}\\\text{Gas}}}{NOCl} + \underset{\text{Water}}{2H_2O} + \underset{\text{Chlorine}}{Cl_2}$$

Acid. Oleicum ($HC_{18}H_{33}O_2$).

$C_3H_5 3C_{18}H_{33}O_2 + 3KHO = 3KC_{18}H_{33}O_2 + C_3H_5 3HO$
Olive Oil — Potassium Hydrate — Potassium Oleate — Glycerin

$2KC_{18}H_{33}O_2 + H_2C_4H_4O_6 = 2HC_{18}H_{33}O_2 + K_2C_4H_4O_6$
Potassium Oleate — Tartaric Acid — Oleic Acid — Potassium Tartrate

Acid. Phosphoricum Concentratum (H_3PO_4).

$3P_2 + 10HNO_3 + 4H_2O = 6H_3PO_4 + 10NO$
Phosphorus — Nitric Acid — Water — Phosphoric Acid — Nitric Oxide

Acid. Salicylicum ($HC_7H_5O_3$).

$HC_6H_5O + CO_2 = HC_7H_5O_3$
Carbolic Acid — Carbonic Acid Gas — Salicylic Acid

Acid. Sulphuricum (H_2SO_4).

$S_2 + 2O_2 = 2SO_2$
Sulphur — Oxygen — Sulphurous Acid Gas

$SO_2 + H_2O = H_2SO_3$
Sulphurous Acid Gas — Water — Sulphurous Acid

$H_2SO_3 + NO_2 = H_2SO_4 + NO$
Sulphurous Acid — Nitric Peroxide — Sulphuric Acid — Nitric Oxide

$(2NO + O_2 = 2NO_2)$
Nitric Oxide — Oxygen — Nitric Peroxide

Acid. Sulphurosum (H_2SO_3).

$4H_2SO_4 + C_2 = 4H_2SO_3 + 2CO_2$
Sulphuric Acid — Carbon — Sulphurous Acid — Carbonic Acid Gas

Acid. Tartaricum ($H_2C_4H_4O_6$).

$2KHC_4H_4O_6 + CaCO_3 = CaC_4H_4O_6 + K_2C_4H_4O_6 + H_2O + CO_2$
Acid Tartrate of Potassium — Calcium Carbonate — Tartrate of Calcium — Tartrate of Potassium — Water — Carbonic Acid Gas

$K_2C_4H_4O_6 + CaCl_2 = CaC_4H_4O_6 + 2KCl$
Tartrate of Potassium — Chloride of Calcium — Tartrate of Calcium — Chloride of Potassium

$2CaC_4H_4O_6 + 2H_2SO_4 = 2H_2C_4H_4O_6 + 2CaSO_4$
Tartrate of Calcium — Sulphuric Acid — Tartaric Acid — Calcium Sulphate

Æther ($C_4H_{10}O$).

$$\underset{\text{Alcohol}}{C_2H_5HO} + \underset{\text{Sulphuric Acid}}{H_2SO_4} = \underset{\text{Sulphovinic Acid}}{C_2H_5HSO_4} + \underset{\text{Water}}{H_2O}$$

$$\underset{\text{Sulphovinic Acid}}{C_2H_5HSO_4} + \underset{\text{Alcohol}}{C_2H_5HO} = \underset{\text{Ether}}{(C_2H_5)_2O} + \underset{\text{Sulphuric Acid}}{H_2SO_4}$$

Æther Aceticus ($C_2H_5C_2H_3O_2$).

$$\underset{\text{Alcohol}}{C_2H_5HO} + \underset{\text{Sodium Acetate}}{NaC_2H_3O_2} + \underset{\text{Sulphuric Acid}}{H_2SO_4} = \underset{\text{Acetic Ether}}{C_2H_5C_2H_3O_2} + \underset{\text{Acid Sulphate of Sodium}}{NaHSO_4} + \underset{\text{Water}}{H_2O}$$

Æther Nitrosi Spiritus ($C_2H_5NO_2$).

$$\underset{\text{Alcohol}}{2C_2H_5HO} + \underset{\text{Nitric Acid}}{2HNO_3} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} + \underset{\text{Copper}}{Cu_2} = \underset{\text{Nitrous Ether}}{2C_2H_5NO_2} + \underset{\text{Water}}{4H_2O} + \underset{\text{Sulphate of Copper}}{2CuSO_4}$$

Alcohol (C_2H_5HO).

$$\underset{\text{Grape Sugar}}{C_6H_{12}O_6} + \text{Fermentation} = \underset{\text{Alcohol}}{2C_2H_5HO} + \underset{\text{Carbonic Acid Gas}}{2CO_2}$$

Alumen—(Potassium)—($Al_23SO_4,K_2SO_4,24H_2O$).

$$\underset{\text{Oxide of Aluminium}}{Al_2O_3} + \underset{\text{Sulphuric Acid}}{3H_2SO_4} + \underset{\text{Sulphate of Potassium}}{K_2SO_4} + \underset{\text{Water}}{21H_2O} = \underset{\text{Potassium Alum}}{Al_23SO_4,K_2SO_4,24H_2O}$$

Alumen—(Ammonium)—($Al_23SO_4,(NH_4)_2SO_4,24H_2O$).

As above, substituting $(NH_4)_2SO_4$ for K_2SO_4

Ammoniæ Fortis Liquor (NH_4HO).

$$\underset{\text{Ammonium Chloride}}{2NH_4Cl} + \underset{\text{Calcium Hydrate}}{Ca2HO} = \underset{\text{Ammonium Hydrate (Ammonia)}}{2NH_4HO} + \underset{\text{Calcium Chloride}}{CaCl_2}$$

Ammonii Acetatis Liquor ($NH_4C_2H_3O_2$).

$$\underset{\text{Acid Carbonate and Carbamate of Ammonium}}{(NH_4HCO_3)_2,NH_4NH_2CO_2} + \underset{\text{Acetic Acid}}{4HC_2H_3O_2} = \underset{\text{Acetate of Ammonium}}{4NH_4C_2H_3O_2} + \underset{\text{Water}}{2H_2O} + \underset{\text{Carbonic Acid Gas}}{3CO_2}$$

Ammonii Benzoas ($NH_4C_7H_5O_2$).

$$\underset{\text{Benzoic Acid}}{HC_7H_5O_2} + \underset{\text{Ammonia}}{NH_4HO} = \underset{\text{Ammonium Benzoate}}{NH_4C_7H_5O_2} + \underset{\text{Water}}{H_2O}$$

Ammonii Bromidum (NH_4Br).

$$\underset{\substack{\text{Hydrobromic}\\\text{Acid}}}{HBr} + \underset{\text{Ammonia}}{NH_4HO} = \underset{\substack{\text{Ammonium}\\\text{Bromide}}}{NH_4Br} + \underset{\text{Water}}{H_2O}$$

Ammonii Carbonas ($N_3H_{11}C_2O_5$).

$$\underset{\substack{\text{Calcium}\\\text{Carbonate}}}{2CaCO_3} + \underset{\substack{\text{Ammonium}\\\text{Chloride}}}{4NH_4Cl} = \underset{\substack{\text{Ammonium}\\\text{Carbonate}}}{N_3H_{11}C_2O_5} + \underset{\substack{\text{Calcium}\\\text{Chloride}}}{2CaCl_2} + \underset{\text{Water}}{H_2O} + \underset{\text{Ammonia Gas}}{NH_3}$$

Ammonii Citratis Liquor ($(NH_4)_3C_6H_5O_7$).

$$\underset{\text{Citric Acid}}{H_3C_6H_5O_7} + \underset{\text{Ammonia}}{3NH_4HO} = \underset{\text{Ammonium Citrate}}{(NH_4)_3C_6H_5O_7} + \underset{\text{Water}}{3H_2O}$$

Ammonii Chloridum (NH_4Cl).

$$\underset{\text{Ammonia}}{NH_4HO} + \underset{\substack{\text{Hydrochloric}\\\text{Acid}}}{HCl} = \underset{\substack{\text{Ammonium}\\\text{Chloride}}}{NH_4Cl} + \underset{\text{Water}}{H_2O}$$

Ammonii Phosphas ($(NH_4)_2HPO_4$).

$$\underset{\substack{\text{Phosphoric}\\\text{Acid}}}{H_3PO_4} + \underset{\text{Ammonia}}{2NH_4HO} = \underset{\substack{\text{Ammonium}\\\text{Phosphate}}}{(NH_4)_2HPO_4} + \underset{\text{Water}}{2H_2O}$$

Amyl Nitris ($C_5H_{11}NO_2$).

$$\underset{\substack{\text{Amylic}\\\text{Alcohol}}}{2C_5H_{12}O} + \underset{\text{Copper}}{Cu_2} + \underset{\substack{\text{Sulphuric}\\\text{Acid}}}{2H_2SO_4} + \underset{\substack{\text{Nitric}\\\text{Acid}}}{2HNO_3} = \underset{\substack{\text{Amyl}\\\text{Nitrite}}}{2C_5H_{11}NO_2} + \underset{\text{Copper Sulphate}}{2CuSO_4} + \underset{\text{Water}}{4H_2O}$$

Antimonii Oxidum (Sb_4O_6)

$$\underset{\substack{\text{Antimonious}\\\text{Chloride}}}{12SbCl_3} + \underset{\text{Water}}{15H_2O} = \underset{\substack{\text{Antimonious}\\\text{Oxychloride}}}{2SbCl_3{,}5Sb_2O_3} + \underset{\substack{\text{Hydrochloric}\\\text{Acid}}}{30HCl}$$

$$\underset{\substack{\text{Antimonious}\\\text{Oxychloride}}}{2SbCl_3{,}5Sb_2O_3} + \underset{\substack{\text{Sodium}\\\text{Carbonate}}}{3Na_2CO_3} = \underset{\substack{\text{Antimonious}\\\text{Oxide}}}{3Sb_4O_6} + \underset{\substack{\text{Sodium}\\\text{Chloride}}}{6NaCl} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas}}}{3CO_2}$$

Antimonium Sulphuratum.

I.

$$\underset{\text{Antimonious Sulphide}}{4Sb_2S_3} + \underset{\text{Sodium Hydrate}}{12NaHO} + \underset{\text{Sulphur}}{2S_2} = \underset{\text{Sulph-antimoniate of Sodium}}{4Na_3SbS_4} +$$

$$\underset{\text{Antimonious Oxide}}{Sb_4O_6} + \underset{\text{Water}}{6H_2O}$$

$$\underset{\text{Antimonious Oxide}}{Sb_4O_6} + \underset{\text{Sodium Hydrate}}{12NaHO} = \underset{\text{Sodium Antimonite}}{4Na_3SbO_3} + \underset{\text{Water}}{6H_2O}$$

II.

$$\underset{\text{Sulph-antimoniate of Sodium}}{2Na_3SbS_4} + \underset{\text{Sulphuric Acid}}{6H_2SO_4} + \underset{\text{Sodium Antimonite}}{2Na_3SbO_3} = \underset{\text{Sulphate of Sodium}}{6Na_2SO_4}$$

$$+ \underset{\text{Antimonious Sulphide}}{Sb_2S_5} + \underset{\text{Antimonious Oxide}}{Sb_2O_3} + \underset{\text{Sulphuretted Hydrogen}}{3H_2S} + \underset{\text{Water}}{3H_2O}$$

Antimonium Tartaratum ($(KSbOC_4H_4O_6)_2H_2O$).

$$\underset{\text{Acid Tartrate of Potassium}}{2KHC_4H_4O_6} + \underset{\text{Antimonious Oxide}}{Sb_2O_3} = \underset{\text{Tartar Emetic}}{(KSbOC_4H_4O_6)_2H_2O}$$

Apomorphinæ Hydrochloridum ($C_{17}H_{17}NO_2,HCl$).

$$\underset{\text{Morphine}}{C_{17}H_{19}NO_3} - \underset{\text{Water}}{H_2O} = \underset{\text{Apomorphine}}{C_{17}H_{17}NO_2} \quad (\textit{minus})$$

$$\underset{\text{Apomorphine}}{C_{17}H_{17}NO_2} + \underset{\text{Hydrochloric Acid}}{HCl} = \underset{\text{Hydrochloride of Apomorphine}}{C_{17}H_{17}NO_2,HCl}$$

Argenti Nitras ($AgNO_3$).

$$\underset{\text{Silver}}{3Ag_2} + \underset{\text{Nitric Acid}}{8HNO_3} = \underset{\text{Nitric Oxide}}{2NO} + \underset{\text{Nitrate of Silver}}{6AgNO_3} + \underset{\text{Water}}{4H_2O}$$

Argenti Oxidum (Ag_2O).

$$\underset{\text{Nitrate of Silver}}{2AgNO_3} + \underset{\text{Hydrate of Calcium}}{Ca2HO} = \underset{\text{Oxide of Silver}}{Ag_2O} + \underset{\text{Nitrate of Calcium}}{Ca2NO_3} + \underset{\text{Water}}{H_2O}$$

Arsenii Iodidum (AsI_3).

$$\underset{\text{Arsenium}}{As_2} + \underset{\text{Iodine}}{3I_2} = \underset{\text{Arsenious Iodide}}{2AsI_3}$$

Bismuthi Carbonas $\left\{ (Bi_2O_2CO_3)_2,H_2O \right\}$.

$$\underset{\text{Bismuth}}{Bi_2} + \underset{\substack{\text{Nitric}\\\text{Acid}}}{8HNO_3} = \underset{\substack{\text{Nitrate of}\\\text{Bismuth}}}{2Bi3NO_3} + \underset{\substack{\text{Nitric}\\\text{Oxide}}}{2NO} + \underset{\text{Water}}{4H_2O}$$

$$\underset{\substack{\text{Nitrate of}\\\text{Bismuth}}}{2Bi3NO_3} + \underset{\substack{\text{Carbonate of}\\\text{Ammonium}}}{2N_3H_{11}C_2O_5} + \underset{\text{Water}}{H_2O} = \underset{\substack{\text{Nitrate of}\\\text{Ammonium}}}{6NH_4NO_3} +$$

$$\underset{\substack{\text{Bismuth}\\\text{Oxycarbonate}}}{Bi_2O_2CO_3} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas}}}{3CO_2}$$

Bismuthi Oxidum (Bi_2O_3).

$$\underset{\substack{\text{Subnitrate of}\\\text{Bismuth}}}{2BiONO_3} + \underset{\substack{\text{Hydrate of}\\\text{Sodium}}}{2NaHO} = \underset{\substack{\text{Oxide of}\\\text{Bismuth}}}{Bi_2O_3} + \underset{\substack{\text{Nitrate of}\\\text{Sodium}}}{2NaNO_3} + \underset{\text{Water}}{H_2O}$$

Bismuthi Salicylas ($C_6H_4OHCOOBiO$).

$$\underset{\text{Bismuth}}{Bi_2} + \underset{\text{Nitric Acid}}{8HNO_3} = \underset{\substack{\text{Bismuth}\\\text{Nitrate}}}{2(Bi3NO_3)} + \underset{\substack{\text{Nitric}\\\text{Oxide}}}{2NO} + \underset{\text{Water}}{4H_2O}$$

$$\underset{\substack{\text{Bismuth}\\\text{Nitrate}}}{Bi3NO_3} + \underset{\text{Water}}{H_2O} = \underset{\substack{\text{Bismuth}\\\text{Subnitrate}}}{BiONO_3} + \underset{\substack{\text{Nitric}\\\text{Acid}}}{2HNO_3}$$

$$\underset{\substack{\text{Sodium Salicylate}}}{(C_6H_4OHCOONa)_2H_2O} + \underset{\text{Bismuth Subnitrate}}{BiONO_3} =$$

$$\underset{\substack{\text{Bismuth Salicylate}}}{C_6H_4OHCOOBiO} + \underset{\text{Sodium Nitrate}}{NaNO_3}$$

Bismuthi Subnitras ($BiONO_3,H_2O$).

$$\underset{\text{Bismuth}}{Bi_2} + \underset{\text{Nitric Acid}}{8HNO_3} = \underset{\substack{\text{Nitrate of}\\\text{Bismuth}}}{2(Bi3NO_3)} + \underset{\substack{\text{Nitric}\\\text{Oxide}}}{2NO} + \underset{\text{Water}}{4H_2O}$$

$$\underset{\substack{\text{Nitrate of}\\\text{Bismuth}}}{5(Bi3NO_3)} + \underset{\text{Water}}{8H_2O} = \underset{\substack{\text{Oxynitrate of}\\\text{Bismuth}}}{4(BiONO_3H_2O)} + \underset{\substack{\text{Nitrate of Bismuth}\\\text{in Acid}}}{Bi3NO_3,8HNO_3}$$

Borax ($Na_2B_4O_710H_2O$).

$$\underset{\substack{\text{Boric}\\\text{Acid}}}{4HBO_2} + \underset{\substack{\text{Carbonate of}\\\text{Sodium}}}{Na_2CO_3} = \underset{\text{Borax}}{Na_2B_4O_7} + \underset{\text{Water}}{2H_2O} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas}}}{CO_2}$$

Butyl-Chloral Hydras ($C_4H_5Cl_3O,H_2O$).

$$\underset{\text{Aldehyd.}}{2(C_2H_4O)} = \underset{\text{Crotonic Aldehyd.}}{C_4H_6O} + \underset{\text{Water}}{H_2O}$$

$$\underset{\substack{\text{Crotonic}\\\text{Aldehyd.}}}{C_4H_6O} + \underset{\text{Chlorine}}{Cl_2} = \underset{\substack{\text{Monochlorocroton}\\\text{Aldehyd.}}}{C_4H_5ClO} + \underset{\substack{\text{Hydrochloric}\\\text{Acid}}}{HCl}$$

$$\underset{\substack{\text{Monochlorocroton}\\\text{Aldehyd}}}{C_4H_5ClO} + \underset{\text{Chlorine}}{Cl_2} + \underset{\text{Water}}{H_2O} = \underset{\substack{\text{Butyl-Chloral}\\\text{Hydrate}}}{C_4H_5Cl_3O,H_2O}$$

Calcii Carbonas Præcipitatus ($CaCO_3$).

$$\underset{\text{Chloride of Calcium}}{CaCl_2} + \underset{\text{Carbonate of Sodium}}{Na_2CO_3} = \underset{\text{Carbonate of Calcium}}{CaCO_3} + \underset{\text{Chloride of Sodium}}{2NaCl}$$

Calcii Chloridum ($CaCl_2 2H_2O$).

$$\underset{\text{Calcium Carbonate}}{CaCO_3} + \underset{\text{Hydrochloric Acid}}{2HCl} + \underset{\text{Water}}{H_2O} = \underset{\text{Calcium Chloride}}{CaCl_2,2H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Calcii Hydras ($Ca(OH)_2$).

$$\underset{\text{Lime}}{CaO} + \underset{\text{Water}}{H_2O} = \underset{\text{Calcium Hydroxide}}{Ca(OH)_2}$$

Calcii Hypophosphis ($Ca2PH_2O_2$).

$$\underset{\text{Phosphorus}}{4P_2} + \underset{\text{Water}}{6H_2O} + \underset{\text{Hydrate of Calcium}}{3CaH_2O_2} = \underset{\text{Hypophosphite of Calcium}}{3(Ca2PH_2O_2)} + \underset{\text{Phosphuretted Hydrogen}}{2PH_3}$$

Calcii Phosphas ($Ca_3(PO_4)_2$).

$$\underset{\text{Phosphate of Calcium (impure)}}{Ca_3 2PO_4} + \underset{\text{Hydrochloric Acid}}{4HCl} = \underset{\text{Acid Phosphate of Calcium}}{CaH_4 2PO_4} + \underset{\text{Chloride of Calcium}}{2CaCl_2}$$

$$\underset{\text{Acid Phosphate of Calcium}}{CaH_4 2PO_4} + \underset{\text{Chloride of Calcium}}{2CaCl_2} + \underset{\text{Ammonia}}{4NH_4HO} = \underset{\text{Phosphate of Calcium}}{Ca_3(PO_4)_2} + \underset{\text{Chloride of Ammonium}}{4NH_4Cl} + \underset{\text{Water}}{4H_2O}$$

Calx (CaO).

$$\underset{\text{Carbonate of Calcium}}{CaCO_3} + \text{Heat} = \underset{\text{Lime}}{CaO} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Calx Chlorinata ($CaCl_2,CaCl_2O_2$).

$$\underset{\text{Hydrate of Calcium}}{2CaH_2O_2} + \underset{\text{Chlorine}}{2Cl_2} = \underset{\text{Chlorinated Lime}}{CaCl_2,CaCl_2O_2} + \underset{\text{Water}}{2H_2O}$$

Carbonis Bisulphidum (CS_2)

$$\underset{\text{Carbon}}{2C} + \underset{\text{Sulphur}}{2S_2} = \underset{\text{Carbon Bisulphide}}{2CS_2}$$

Cerii Oxalas ($Ce_2(C_2O_4)_3 9H_2O$).

$$\underset{\text{Cerium Oxide}}{Ce_2O_3} + \underset{\text{Hydrochloric Acid}}{6HCl} = \underset{\text{Cerium Chloride}}{Ce_2Cl_6} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\text{Cerium Chloride}}{Ce_2Cl_6} + \underset{\text{Ammonium Oxalate}}{3(NH_4)_2C_2O_4} = \underset{\text{Cerium Oxalate}}{Ce_2(C_2O_4)_3} + \underset{\text{Ammonium Chloride}}{6NH_4Cl}$$

Chloral Hydras (C_2HCl_3O,H_2O).

$$\underset{\text{Alcohol}}{C_2H_5HO} + \underset{\text{Chlorine}}{Cl_2} = \underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Hydrochloric Acid}}{2HCl}$$

$$\underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Chlorine}}{3Cl_2} = \underset{\text{Chloral}}{C_2HCl_3O} + \underset{\text{Hydrochloric Acid}}{3HCl}$$

$$\underset{\text{Chloral}}{C_2HCl_3O} + \underset{\text{Water}}{H_2O} = \underset{\text{Chloral Hydrate}}{C_2HCl_3O,H_2O}$$

Chloroformum ($CHCl_3$).

$$\underset{\text{Alcohol}}{2C_2H_6O} + \underset{\text{Oxygen}}{O_2} = \underset{\text{Aldehyd.}}{2C_2H_4O} + \underset{\text{Water}}{2H_2O}$$

$$\underset{\text{Aldehyd.}}{C_2H_4O} + \underset{\text{Chlorine}}{3Cl_2} = \underset{\text{Chloral}}{C_2HCl_3O} + \underset{\text{Hydrochloric Acid}}{3HCl}$$

$$\underset{\text{Chloral}}{2C_2HCl_3O} + \underset{\text{Hydrate of Calcium}}{Ca2HO} = \underset{\text{Formate of Calcium}}{Ca2CHO_2} + \underset{\text{Chloroform}}{2CHCl_3}$$

Cupri Sulphas ($CuSO_4,5H_2O$).

$$\underset{\text{Copper}}{Cu_2} + \underset{\text{Sulphuric Acid}}{4H_2SO_4} = \underset{\text{Sulphate of Copper}}{2CuSO_4} + \underset{\text{Sulphurous Anhydride}}{2SO_2} + \underset{\text{Water}}{4H_2O}$$

FERRIC SALTS—

Ferri Acetatis Liquor

$$\underset{\text{Persulphate of Iron}}{Fe_2 3SO_4} + \underset{\text{Solution of Ammonia}}{6NH_4HO} = \underset{\text{Ferric Hydrate}}{Fe_2 6HO} + \underset{\text{Sulphate of Ammonium}}{3(NH_4)_2SO_4}$$

$$\underset{\text{Ferric Hydrate}}{Fe_2 6HO} + \underset{\text{Acetic Acid}}{6HC_2H_3O_2} = \underset{\text{Acetate of Iron}}{Fe_2 6C_2H_3O_2} + \underset{\text{Water}}{6H_2O}$$

Ferri Perchloridi Liquor Fortis (Fe_2Cl_6).

$$\underset{\text{Protochloride of Iron}}{6FeCl_2} + \underset{\text{Hydrochloric Acid}}{6HCl} + \underset{\text{Nitric Acid}}{2HNO_3} = \underset{\text{Perchloride of Iron}}{3Fe_2Cl_6} + \underset{\text{Nitric Oxide}}{2NO} + \underset{\text{Water}}{4H_2O}$$

Ferri Pernitratis Liquor ($Fe_2 6NO_3$).

$$\underset{\text{Iron}}{Fe_2} + \underset{\text{Nitric Acid}}{8HNO_3} = \underset{\text{Pernitrate of Iron}}{Fe_2 6NO_3} + \underset{\text{Nitric Oxide}}{2NO} + \underset{\text{Water}}{4H_2O}$$

Ferri Persulphatis Liquor ($Fe_2 3SO_4$).

$$\underset{\text{Protosulphate of Iron}}{6FeSO_4} + \underset{\text{Sulphuric Acid}}{3H_2SO_4} + \underset{\text{Nitric Acid}}{2HNO_3} = \underset{\text{Persulphate of Iron}}{3(Fe_2 3SO_4)} + \underset{\text{Nitric Oxide}}{2NO} + \underset{\text{Water}}{4H_2O}$$

Ferrum Redactum (Fe and Fe_3O_4).

$$\underset{\text{Ferric Oxide}}{Fe_2O_3} + \underset{\text{Hydrogen}}{3H_2} = \underset{\text{Iron}}{Fe_2} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\text{Ferric Oxide}}{3Fe_2O_3} + \underset{\text{Hydrogen}}{H_2} = \underset{\text{Iron Oxide}}{2Fe_3O_4} + \underset{\text{Water}}{H_2O}$$

Ferrum Tartaratum ($K_6Fe_26C_4H_4O_6$).

$$\underset{\text{Persulphate of Iron}}{Fe_23SO_4} + \underset{\text{Ammonia}}{6NH_4HO} = \underset{\text{Ferric Hydrate}}{Fe_26HO} + \underset{\text{Sulphate of Ammonium}}{3(NH_4)_2SO}$$

$$\underset{\text{Acid Tartrate of Potassium}}{6KHC_4H_4O_6} + \underset{\text{Ferric Hydrate}}{Fe_26HO} = \underset{\text{Tartarated Iron}}{K_6Fe_26C_4H_4O_6} + \underset{\text{Water}}{6H_2O}$$

FERROUS SALTS—

Ferri Arsenas ($Fe_3As_2O_8$).

$$\underset{\text{Arsenate of Sodium}}{2Na_2HAsO_4} + \underset{\text{Bicarbonate of Sodium}}{2NaHCO_3} + \underset{\text{Sulphate of Iron}}{3FeSO_4} = \underset{\text{Arsenate of Iron}}{Fe_32AsO_4} + \underset{\text{Sulphate of Sodium}}{3Na_2SO_4} + \underset{\text{Carbonic Acid Gas}}{2CO_2} + \underset{\text{Water}}{4H_2O}$$

Ferri Phosphas ($Fe_3P_2O_8$).

$$\underset{\text{Sulphate of Iron}}{3FeSO_4} + \underset{\text{Phosphate of Sodium}}{2Na_2HPO_4} + \underset{\text{Bicarbonate of Sodium}}{2NaHCO_3} = \underset{\text{Phosphate of Iron}}{Fe_3(PO_4)_2} + \underset{\text{Sulphate of Sodium}}{3Na_2SO_4} + \underset{\text{Carbonic Acid Gas}}{2CO_2} + \underset{\text{Water}}{2H_2O}$$

Ferri Sulphas ($FeSO_4,7H_2O$); Ferri Sulphas Exsiccatus ($FeSO_4,H_2O$).

$$\underset{\text{Iron}}{Fe_2} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} = \underset{\text{Sulphate of Iron}}{2FeSO_4} + \underset{\text{Hydrogen}}{2H_2}$$

Glycerinum ($C_3H_5(HO)_3$).

$$\underset{\substack{\text{Hydrate of Sodium}\\\text{(Caustic Soda)}}}{3NaHO} + \underset{\substack{\text{Oleate of Glyceryl}\\\text{(Vegetable Oil)}}}{C_3H_53C_{18}H_{33}O_2} = \underset{\substack{\text{Hydrate of Glyceryl}\\\text{(Glycerin)}}}{C_3H_5(HO)_3} + \underset{\substack{\text{Oleate of Sodium}\\\text{(Hard Soap)}}}{3NaC_{18}H_{33}O_2}$$

MERCURIC SALTS—

Hydrargyrum Ammoniatum (NH_2HgCl).

$$\underset{\substack{\text{Perchloride}\\\text{of Mercury}}}{HgCl_2} + \underset{\text{Ammonia}}{2NH_4HO} = \underset{\substack{\text{Ammoniated}\\\text{Mercury}}}{NH_2HgCl} + \underset{\substack{\text{Chloride of}\\\text{Ammonium}}}{NH_4Cl} + \underset{\text{Water}}{2H_2O}$$

Hydrargyri Flava Lotio (HgO).

$$\underset{\text{Perchloride of Mercury}}{HgCl_2} + \underset{\text{Lime}}{Ca2HO} = \underset{\text{Yellow Oxide of Mercury}}{HgO} + \underset{\text{Chloride of Calcium}}{CaCl_2} + \underset{\text{Water}}{H_2O}$$

Hydrargyri Iodidum Rubrum (HgI_2).

$$\underset{\text{Perchloride of Mercury}}{HgCl_2} + \underset{\text{Iodide of Potassium}}{2KI} = \underset{\text{Red Iodide of Mercury}}{HgI_2} + \underset{\text{Chloride of Potassium}}{2KCl}$$

Hydrargyri Nitratis Acidus Liquor ($Hg2NO_3$).

$$\underset{\text{Mercury}}{3Hg} + \underset{\text{Nitric Acid}}{8HNO_3} = \underset{\text{Nitrate of Mercury}}{3(Hg2NO_3)} + \underset{\text{Nitric Oxide}}{2NO} + \underset{\text{Water}}{4H_2O}$$

Hydrargyri Oxidum Flavum (HgO).

$$\underset{\text{Perchloride of Mercury}}{HgCl_2} + \underset{\text{Hydrate of Sodium}}{2NaHO} = \underset{\text{Yellow Oxide of Mercury}}{HgO} + \underset{\text{Chloride of Sodium}}{2NaCl} + \underset{\text{Water}}{H_2O}$$

Hydrargyri Oxidum Rubrum (HgO).

$$\underset{\text{Mercury}}{Hg} + \underset{\text{Nitrate of Mercury}}{Hg2NO_3} = \underset{\text{Red Oxide of Mercury}}{2HgO} + \underset{\text{Nitric Peroxide}}{2NO_2}$$

Hydrargyri Perchloridum ($HgCl_2$).

$$\underset{\text{Persulphate of Mercury}}{HgSO_4} + \underset{\text{Chloride of Sodium}}{2NaCl} = \underset{\text{Perchloride of Mercury}}{HgCl_2} + \underset{\text{Sulphate of Sodium}}{Na_2SO_4}$$

MERCUROUS SALTS—

Hydrargyri Nigra Lotio (Hg_2O in water).

$$\underset{\text{Subchloride of Mercury}}{Hg_2Cl_2} + \underset{\text{Lime}}{Ca2HO} = \underset{\text{Black Oxide of Mercury}}{Hg_2O} + \underset{\text{Chloride of Calcium}}{CaCl_2} + \underset{\text{Water}}{H_2O}$$

Hydrargyri Subchloridum (Hg_2Cl_2).

$$\underset{\text{Mercuric Sulphate}}{HgSO_4} + \underset{\text{Mercury}}{Hg} = \underset{\text{Mercurous Sulphate}}{Hg_2SO_4}$$

$$\underset{\text{Mercurous Sulphate}}{Hg_2SO_4} + \underset{\text{Chloride of Sodium}}{2NaCl} = \underset{\text{Subchloride of Mercury}}{Hg_2Cl_2} + \underset{\text{Sulphate of Sodium}}{Na_2SO_4}$$

Hydrogenum Peroxidum (H_2O_2).

$$\underset{\text{Peroxide of Barium}}{BaO_2} + \underset{\text{Hydrochloric Acid}}{2HCl} = \underset{\text{Chloride of Barium}}{BaCl_2} + \underset{\text{Peroxide of Hydrogen}}{H_2O_2}$$

Iodoformum (CHI_3).

$$\underset{\text{Ethylic Alcohol}}{C_2H_5HO} + \underset{\text{Carbonate of Potassium}}{3K_2CO_3} + \underset{\text{Iodine}}{4I_2} = \underset{\text{Iodoform}}{CHI_3} + \underset{\text{Iodide of Potassium}}{5KI} +$$
$$\underset{\text{Formate of Potassium}}{KCHO_2} + \underset{\text{Carbonic Acid Gas}}{3CO_2} + \underset{\text{Water}}{2H_2O}$$

Iodum (I).

$$\underset{\text{Iodide of Sodium}}{2NaI} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} + \underset{\text{Oxide of Manganese}}{MnO_2} = \underset{\text{Iodine}}{I_2} + \underset{\text{Sulphate of Sodium}}{Na_2SO_4} + \underset{\text{Sulphate of Manganese}}{MnSO_4} + \underset{\text{Water}}{2H_2O}$$

Lithii Citras ($L_3C_6H_5O_74H_2O$).

$$\underset{\text{Carbonate of Lithium}}{3Li_2CO_3} + \underset{\text{Citric Acid}}{2H_3C_6H_5O_7} = \underset{\text{Citrate of Lithium}}{2Li_3C_6H_5O_7} + \underset{\text{Water}}{3H_2O} + \underset{\text{Carbonic Acid Gas}}{3CO_2}$$

Magnesia Levis (MgO) Magnesia Ponderosa (MgO).

$$\underset{\text{Carbonate of Magnesium}}{(MgCO_3)_3Mg(OH)_2} = \underset{\text{Magnesia}}{4MgO} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{3CO_2}$$

Magnesii Carbonas Levis
Magnesii Carbonas Ponderosa } $((MgCO_3)_3Mg(HO)_24H_2O)$

$$\underset{\text{Sulphate of Magnesium}}{4MgSO_4} + \underset{\text{Carbonate of Sodium}}{4Na_2CO_3} + \underset{\text{Water}}{5H_2O} = \underset{\text{Carbonate of Magnesium}}{(MgCO_3)_3Mg(HO)_24H_2O}$$
$$+ \underset{\text{Sulphate of Sodium}}{4Na_2SO_4} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Magnesii Sulphas ($MgSO_4,7H_2O$).

$$\underset{\text{Carbonate of Magnesium}}{MgCO_3} + \underset{\text{Sulphuric Acid}}{H_2SO_4} = \underset{\text{Sulphate of Magnesium}}{MgSO_4} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Paraldehydum ($C_6H_{12}O_3$).

$$\underset{\text{Aldehyde}}{3C_2H_4O} = \underset{\text{Paraldehyde}}{C_6H_{12}O_3}$$

Phenacetinum ($C_{10}H_{13}NO_2$).

$$\underset{\text{Acetic Acid}}{HC_2H_3O_2} + \underset{\text{Paraphenetidin}}{C_6H_4OC_2H_5NH_2} = \underset{\text{Phenacetin}}{C_{10}H_{13}NO_2} + \underset{\text{Water}}{H_2O}$$

Phosphorus (P).

$$\underset{\text{Bone Earth}}{Ca_3 2PO_4} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} = \underset{\text{Acid Phosphate of Calcium}}{CaH_4 2PO_4} + \underset{\text{Sulphate of Calcium}}{2CaSO_4}$$

$$\underset{\text{Acid Phosphate of Calcium}}{3CaH_4 2PO_4} = \underset{\text{Phosphate of Calcium}}{Ca_3 2PO_4} + \underset{\text{Phosphoric Acid}}{4H_3PO_4}$$

$$\underset{\text{Phosphoric Acid}}{4H_3PO_4} + \underset{\text{Carbon}}{8C_2} = \underset{\text{Phosphorus}}{2P_2} + \underset{\text{Hydrogen}}{6H_2} + \underset{\text{Carbonic Oxide}}{16CO}$$

Plumbi Acetas ($Pb(C_2H_3O_2)_2,3H_2O$).

$$\underset{\text{Oxide of Lead}}{PbO} + \underset{\text{Acetic Acid}}{2HC_2H_3O_2} = \underset{\text{Acetate of Lead}}{Pb(C_2H_3O_2)_2} + \underset{\text{Water}}{H_2O}$$

Plumbi Subacetatis Liquor ($Pb_2O(C_2H_3O_2)_2$).

$$\underset{\text{Oxide of Lead}}{PbO} + \underset{\text{Acetate of Lead}}{Pb(C_2H_3O_2)_2} = \underset{\text{Oxyacetate of Lead}}{Pb_2O(C_2H_3O_2)_2}$$

Plumbi Iodidum (PbI_2).

$$\underset{\text{Iodide of Potassium}}{2KI} + \underset{\text{Nitrate of Lead}}{Pb2NO_3} = \underset{\text{Iodide of Lead}}{PbI_2} + \underset{\text{Nitrate of Potassium}}{2KNO_3}$$

Plumbi Oxidum (PbO).

$$\underset{\text{Lead}}{Pb_2} + \underset{\text{Oxygen}}{O_2} = \underset{\text{Oxide of Lead}}{2PbO}$$

Potassa Caustica (KHO).

$$\underset{\text{Carbonate of Potassium}}{K_2CO_3} + \underset{\text{Hydrate of Calcium}}{Ca2HO} = \underset{\text{Caustic Potash}}{2KHO} + \underset{\text{Carbonate of Calcium}}{CaCO_3}$$

Potassa Sulphurata ($K_2S_2O_3,2K_2S_3$).

$$\underset{\text{Carbonate of Potassium}}{3K_2CO_3} + \underset{\text{Sulphur}}{4S_2} = \underset{\text{Sulphurated Potash}}{K_2S_2O_3,2K_2S_3} + \underset{\text{Carbonic Acid Gas}}{3CO_2}$$

Potassii Acetas ($KC_2H_3O_2$).

$$\underset{\text{Carbonate of Potassium}}{K_2CO_3} + \underset{\text{Acetic Acid}}{2HC_2H_3O_2} = \underset{\text{Acetate of Potassium}}{2KC_2H_3O_2} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Potassii Bicarbonas ($KHCO_3$).

$$\underset{\text{Carbonate of Potassium}}{K_2CO_3} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2} = \underset{\text{Bicarbonate of Potassium}}{2KHCO_3}$$

Potassii Bichromas ($K_2Cr_2O_7$).

$$\underset{\text{Chrome Iron Ore}}{2(FeOCr_2O_3)} + \underset{\substack{\text{Carbonate of}\\\text{Potassium}}}{4K_2CO_3} + \underset{\text{Oxygen}}{O_7} = \underset{\substack{\text{Oxide of}\\\text{Iron}}}{Fe_2O_3} + \underset{\substack{\text{Yellow Chromate}\\\text{of Potassium}}}{4K_2CrO_4} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas}}}{4CO_2}$$

$$\underset{\substack{\text{Yellow Chromate}\\\text{of Potassium}}}{2K_2CrO_4} + \underset{\substack{\text{Sulphuric}\\\text{Acid}}}{H_2SO_4} = \underset{\substack{\text{Bichromate of}\\\text{Potassium}}}{K_2Cr_2O_7} + \underset{\substack{\text{Sulphate of}\\\text{Potassium}}}{K_2SO_4} + \underset{\text{Water}}{H_2O}$$

Potassii Bromidum (KBr).

$$\underset{\substack{\text{Hydrate of}\\\text{Potassium}}}{6KHO} + \underset{\text{Bromine}}{3Br_2} = \underset{\substack{\text{Bromide of}\\\text{Potassium}}}{5KBr} + \underset{\substack{\text{Bromate of}\\\text{Potassium}}}{KBrO_3} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\substack{\text{Bromide of}\\\text{Potassium}}}{10KBr} + \underset{\substack{\text{Bromate of}\\\text{Potassium}}}{2KBrO_3} + \underset{\text{Carbon}}{3C_2} = \underset{\substack{\text{Bromide of}\\\text{Potassium}}}{12KBr} + \underset{\substack{\text{Carbonic}\\\text{Oxide}}}{6CO}$$

Potassii Chloras ($KClO_3$).

$$\underset{\substack{\text{Black Oxide of}\\\text{Manganese}}}{MnO_2} + \underset{\substack{\text{Hydrochloric}\\\text{Acid}}}{4HCl} = \underset{\substack{\text{Chloride of}\\\text{Manganese}}}{MnCl_2} + \underset{\text{Water}}{2H_2O} + \underset{\text{Chlorine}}{Cl_2}$$

$$\underset{\text{Chlorine}}{6Cl_2} + \underset{\substack{\text{Carbonate of}\\\text{Potassium}}}{K_2CO_3} + \underset{\substack{\text{Slaked}\\\text{Lime}}}{6CaH_2O_2} = \underset{\substack{\text{Chlorate of}\\\text{Potassium}}}{2KClO_3} + \underset{\substack{\text{Carbonate of}\\\text{Calcium}}}{CaCO_3} + \underset{\substack{\text{Chloride of}\\\text{Calcium}}}{5CaCl_2} + \underset{\text{Water}}{6H_2O}$$

Potassii Citras ($K_3C_6H_5O_7$).

$$\underset{\substack{\text{Carbonate of}\\\text{Potassium}}}{3K_2CO_3} + \underset{\text{Citric Acid}}{2H_3C_6H_5O_7} = \underset{\substack{\text{Citrate of}\\\text{Potassium}}}{2K_3C_6H_5O_7} + \underset{\text{Water}}{3H_2O} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas}}}{3CO_2}$$

Potassii Iodidum (KI).

$$\underset{\substack{\text{Hydrate of}\\\text{Potassium}}}{6KHO} + \underset{\text{Iodine}}{3I_2} = \underset{\substack{\text{Iodide of}\\\text{Potassium}}}{5KI} + \underset{\substack{\text{Iodate of}\\\text{Potassium}}}{KIO_3} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\substack{\text{Iodide of}\\\text{Potassium}}}{10KI} + \underset{\substack{\text{Iodate of}\\\text{Potassium}}}{2KIO_3} + \underset{\text{Carbon}}{3C_2} = \underset{\substack{\text{Iodide of}\\\text{Potassium}}}{12KI} + \underset{\substack{\text{Carbonic}\\\text{Oxide}}}{6CO}$$

Potassii Nitras (KNO_3).

$$\underset{\substack{\text{Carbonate of}\\\text{Potassium}}}{K_2CO_3} + \underset{\text{Nitric Acid}}{2HNO_3} = \underset{\substack{\text{Nitrate of}\\\text{Potassium}}}{2KNO_3} + \underset{\text{Water}}{H_2O} + \underset{\substack{\text{Carbonic}\\\text{Acid Gas}}}{CO_2}$$

Potassii Permanganas ($K_2Mn_2O_8$).

$$\underset{\text{Hydrate of Potassium}}{6KHO} + \underset{\text{Chlorate of Potassium}}{KClO_3} + \underset{\text{Black Oxide of Manganese}}{3MnO_2} =$$

$$\underset{\text{Manganate of Potassium}}{3K_2MnO_4} + \underset{\text{Chloride of Potassium}}{KCl} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\text{Manganate of Potassium}}{3K_2MnO_4} + \underset{\text{Water}}{2H_2O} = \underset{\text{Permanganate of Potassium}}{K_2Mn_2O_8} + \underset{\text{Hydrate of Potassium}}{4KHO}$$

$$+ \underset{\text{Black Oxide of Manganese}}{MnO_2}$$

Potassii Sulphas (K_2SO_4).

$$\underset{\text{Carbonate of Potassium}}{K_2CO_3} + \underset{\text{Sulphuric Acid}}{H_2SO_4} = \underset{\text{Sulphate of Potassium}}{K_2SO_4} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Potassii Tartras ($K_2C_4H_4O_6H_2O$).

$$\underset{\text{Acid Tartrate of Potassium}}{2KHC_4H_4O_6} + \underset{\text{Carbonate of Potassium}}{K_2CO_3} = \underset{\text{Tartrate of Potassium}}{2K_2C_4H_4O_6} +$$

$$\underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Potassii Tartras Acida ($KHC_4H_4O_6$).

$$\underset{\text{Tartaric Acid}}{2H_2C_4H_4O_6} + \underset{\text{Carbonate of Potassium}}{K_2CO_3} = \underset{\text{Acid Tartrate of Potassium}}{2KHC_4H_4O_6} + \underset{\text{Carbonic Acid Gas}}{CO_2} +$$

$$\underset{\text{Water}}{H_2O}$$

Salol ($C_6H_4OHCOOC_6H_5$).

$$\underset{\text{Salicylic Acid}}{C_6H_4OHCOOH} + \underset{\text{Phenol}}{C_6H_5OH} = \underset{\text{Salol}}{C_6H_4OHCOOC_6H_5} + \underset{\text{Water}}{H_2O}$$

Soda Caustica (NaHO).

$$\underset{\text{Carbonate of Sodium}}{Na_2CO_3} + \underset{\text{Hydrate of Calcium}}{Ca2HO} = \underset{\text{Caustic Soda}}{2NaHO} + \underset{\text{Carbonate of Calcium}}{CaCO_3}$$

Soda Tartarata ($NaKC_4H_4O_64H_2O$).

$$\underset{\text{Carbonate of Sodium}}{Na_2CO_3} + \underset{\text{Acid Tartrate of Potassium}}{2KHC_4H_4O_6} = \underset{\text{Tartarated Soda}}{2NaKC_4H_4O_6} +$$

$$\underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Sodii Arsenas ($Na_2HAsO_4,7H_2O$ & $Na_2HAsO_4,12H_2O$).

As_2O_3 + $2NaNO_3$ + Na_2CO_3 = $Na_4As_2O_7$ + N_2O_3 + CO_2

Arsenious Acid; Nitrate of Sodium; Carbonate of Sodium; Pyroarsenate of Sodium; Nitrous Anhydride; Carbonic Acid Gas

$Na_4As_2O_7$ + H_2O = $2Na_2HAsO_4$

Pyroarsenate of Sodium; Water; Arsenate of Sodium

Sodii Benzoas ($NaC_7H_5O_2$).

Na_2CO_3 + $2HC_7H_5O_2$ = $Na_2C_7H_5O_2$ + H_2O + CO_2

Sodium Carbonate; Benzoic Acid; Sodium Benzoate; Water; Carbonic Acid Gas

Sodii Bicarbonas ($NaHCO_3$).

Na_2CO_3 + H_2O + CO_2 = $2NaHCO_3$

Carbonate of Sodium; Water; Carbonic Acid Gas; Bicarbonate of Sodium

Sodii Bromidum (NaBr).

$6NaHO$ + $3Br_2$ = $5NaBr$ + $NaBrO_3$ + $3H_2O$

Hydrate of Sodium; Bromine; Bromide of Sodium; Bromate of Sodium; Water

$10NaBr$ + $2NaBrO_3$ + $3C_2$ = $12NaBr$ + $6CO$

Bromide of Sodium; Bromate of Sodium; Carbon; Bromide of Sodium; Carbonic Oxide

Sodii Carbonas ($Na_2CO_3,10H_2O$).

$2NaCl$ + H_2SO_4 = Na_2SO_4 + $2HCl$

Chloride of Sodium; Sulphuric Acid; Sulphate of Sodium; Hydrochloric Acid

Na_2SO_4 + $2C_2$ = Na_2S + $4CO$

Sulphate of Sodium; Carbon; Sulphide of Sodium; Carbonic Oxide

Na_2S + $CaCO_3$ = Na_2CO_3 + CaS

Sulphide of Sodium; Carbonate of Calcium; Carbonate of Sodium; Sulphide of Calcium

Sodii Hypophosphis ($NaPH_2O_2$).

$Ca2PH_2O_2$ + Na_2CO_3 = $2NaPH_2O_2$ + $CaCO_3$

Hypophosphite of Calcium; Carbonate of Sodium; Hypophosphite of Sodium; Carbonate of Calcium

Sodii Iodidum (NaI).

$6NaHO$ + $3I_2$ = $5NaI$ + $NaIO_3$ + $3H_2O$

Hydrate of Sodium; Iodine; Iodide of Sodium; Iodate of Sodium; Water

$10NaI$ + $2NaIO_3$ + $3C_2$ = $12NaI$ + $6CO$

Iodide of Sodium; Iodate of Sodium; Carbon; Iodide of Sodium; Carbonic Oxide

Sodii Nitris ($NaNO_2$).

$$\underset{\text{Sodium Nitrate}}{2NaNO_3} + \underset{\text{Lead}}{Pb_2} = \underset{\text{Sodium Nitrite}}{2NaNO_2} + \underset{\text{Lead Oxide}}{2PbO}$$

Sodii Phosphas ($Na_2HPO_4 12H_2O$).

$$\underset{\text{Phosphate of Calcium, in Bone Ash}}{Ca_3 2PO_4} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} = \underset{\text{Acid Phosphate of Calcium}}{CaH_4 2PO_4} + \underset{\text{Sulphate of Calcium}}{2CaSO_4}$$

$$\underset{\text{Acid Phosphate of Calcium}}{CaH_4 2PO_4} + \underset{\text{Carbonate of Sodium}}{Na_2CO_3} = \underset{\text{Phosphate of Sodium}}{Na_2HPO_4} + \underset{\text{Water}}{H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2} + \underset{\text{Monocalcic Phosphate}}{CaHPO_4}$$

Sodii Salicylas ($NaC_7H_5O_3)_2H_2O$.

$$\underset{\text{Salicylic Acid}}{2HC_7H_5O_3} + \underset{\text{Carbonate of Sodium}}{Na_2CO_3} = \underset{\text{Salicylate of Sodium}}{(NaC_7H_5O_3)_2} + \underset{\text{Carbonic Acid Gas}}{CO_2} + \underset{\text{Water}}{H_2O}$$

Sodii Sulphas ($Na_2SO_4, 10H_2O$).

$$\underset{\text{Sodium Chloride}}{2NaCl} + \underset{\text{Sulphuric Acid}}{H_2SO_4} = \underset{\text{Sodium Sulphate}}{Na_2SO_4} + \underset{\text{Hydrochloric Acid}}{HCl}$$

Sodii Sulphis ($Na_2SO_3, 7H_2O$).

$$\underset{\text{Sulphurous Acid}}{2H_2SO_3} + \underset{\text{Carbonate of Sodium}}{Na_2CO_3, 10H_2O} = \underset{\text{Acid Sulphite of Sodium}}{2NaHSO_3, 4H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2} + \underset{\text{Water}}{7H_2O}$$

$$\underset{\text{Acid Sulphite of Sodium}}{2NaHSO_3 4H_2O} + \underset{\text{Carbonate of Sodium}}{Na_2CO_3 10H_2O} = \underset{\text{Sulphite of Sodium}}{2Na_2SO_3, 7H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2} + \underset{\text{Water}}{8H_2O}$$

Sodii Sulphocarbolas ($NaC_6H_5SO_4, 2H_2O$).

$$\underset{\text{Sulphuric Acid}}{H_2SO_4} + \underset{\text{Carbolic Acid}}{HC_6H_5O} = \underset{\text{Sulphocarbolic Acid}}{HC_6H_5SO_4} + \underset{\text{Water}}{H_2O}$$

$$\underset{\text{Sulphocarbolic Acid}}{2HC_6H_5SO_4} + \underset{\text{Carbonate of Sodium}}{Na_2CO_3} = \underset{\text{Sulphocarbolate of Sodium}}{2NaC_6H_5SO_4} + \underset{\text{Carbonic Acid Gas}}{CO_2} + \underset{\text{Water}}{H_2O}$$

Sulphur Præcipitatum (S).

$$\underset{\text{Sulphur}}{12S} + \underset{\text{Slaked Lime}}{3CaH_2O_2} = \underset{\text{Polysulphide of Calcium}}{2CaS_5} + \underset{\text{Hyposulphite of Calcium}}{CaS_2O_3} + \underset{\text{Water}}{3H_2O}$$

$$\underset{\text{Polysulphide of Calcium}}{2CaS_5} + \underset{\text{Hyposulphite of Calcium}}{3CaS_2O_3} + \underset{\text{Hydrochloric Acid}}{6HCl} = \underset{\text{Sulphur}}{6S_2} + \underset{\text{Chloride of Calcium}}{3CaCl_2} + \underset{\text{Water}}{3H_2O}$$

Sulphuris Iodidum (S_2I_2).

$$\underset{\text{Sulphur}}{S_2} + \underset{\text{Iodine}}{I_2} = \underset{\text{Iodide of Sulphur}}{S_2I_2}$$

Zinci Acetas ($Zn(C_2H_3O_2)_2,2H_2O$).

$$\underset{\text{Carbonate of Zinc}}{ZnCO_3(Zn2HO)_2H_2O} + \underset{\text{Acetic Acid}}{6HC_2H_3O_2} = \underset{\text{Acetate of Zinc}}{3Zn(C_2H_3O_2)_2} + \underset{\text{Water}}{6H_2O} + \underset{\text{Carbonic Acid Gas}}{CO_2}$$

Zinci Carbonas ($ZnCO_3(Zn2HO)_2,H_2O$).

$$\underset{\text{Sulphate of Zinc}}{3ZnSO_4} + \underset{\text{Water}}{3H_2O} + \underset{\text{Carbonate of Sodium}}{3Na_2CO_3} = \underset{\text{Carbonate of Zinc}}{ZnCO_3(Zn2HO)_2,H_2O} + \underset{\text{Sulphate of Sodium}}{3Na_2SO_4} + \underset{\text{Carbonic Acid Gas}}{2CO_2}$$

Zinci Chloridum ($ZnCl_2$).

$$\underset{\text{Zinc}}{Zn_2} + \underset{\text{Hydrochloric Acid}}{4HCl} = \underset{\text{Chloride of Zinc}}{2ZnCl_2} + \underset{\text{Hydrogen}}{2H_2}$$

Zinci Oxidum (ZnO).

$$\underset{\text{Carbonate of Zinc}}{ZnCO_3(Zn2HO)_2H_2O} = \underset{\text{Oxide of Zinc}}{3ZnO} + \underset{\text{Carbonic Acid Gas}}{CO_2} + \underset{\text{Water}}{3H_2O}$$

Zinci Sulphas ($ZnSO_4,7H_2O$).

$$\underset{\text{Zinc}}{Zn_2} + \underset{\text{Sulphuric Acid}}{2H_2SO_4} = \underset{\text{Sulphate of Zinc}}{2ZnSO_4} + \underset{\text{Hydrogen}}{2H_2}$$

Zinci Sulphocarbolas ($Zn(C_6H_5SO_4)_2,H_2O$).

$$\underset{\text{Sulphuric Acid}}{H_2SO_4} + \underset{\text{Carbolic Acid}}{HC_6H_5O} = \underset{\text{Sulphocarbolic Acid}}{HC_6H_5SO_4} + \underset{\text{Water}}{H_2O}$$

$$\underset{\text{Zinc Oxide}}{ZnO} + \underset{\text{Sulphocarbolic Acid}}{2C_6H_5HSO_4} = \underset{\text{Sulphocarbolate of Zinc}}{Zn(C_6H_5SO_4)_2} + \underset{\text{Water}}{H_2O}$$

Zinci Valerianas ($Zn2C_5H_9O_2$).

$$\underset{\text{Sulphate of Zinc}}{ZnSO_4} + \underset{\text{Valerianate of Sodium}}{2NaC_5H_9O_2} = \underset{\text{Sulphate of Sodium}}{Na_2SO_4} + \underset{\text{Valerianate of Zinc}}{Zn2C_5H_9O_2}$$

OUTLINE OF THE B.P. VEGETABLE MATERIA MEDICA.

(WITH THE NATURAL ORDERS ARRANGED ALPHABETICALLY FOR RAPID REFERENCE.)

Amyridaceæ or Burseraceæ

1. Balsamodendron Myrrha (Myrrh).
2. Probably other species.

The gum-resin from the stem——Tincture 1 in 5; Pill of Aloes and Myrrh 1 in $4\frac{1}{2}$. Also enters into 1 Decoction, 1 Mixture, and 2 Pills.

Apocynaceæ. (See Loganiaceæ.)

Aristolochiaceæ

1. Aristolochia Serpentaria, or
2. Aristolochia reticulata } Serpentary or Snake Root.

The dried rhizome and rootlets——Infusion 1 in 20; Tincture 1 in 5; Concentrated Solution 1 in 2.
Enters into Compound Tincture of Cinchona.

Asclepiadaceæ

Hemidesmus indicus (Indian Sarsaparilla).
The dried root——Syrup 1 in 8.

Aurantiaceæ

1. Citrus Aurantium, *var.* Bigaradia (Bitter Orange).

The *fresh* outer part of the pericarp——Wine. Tincture 1 in 4; Syrup 1 of Tincture in 8.
The *dried* outer part of the pericarp, Infusion 1 in 20; Compound Infusion 1 in 40.
The fresh flowers——Orange-flower Water. Syrup 1 in $6\frac{3}{4}$. The water enters into 1 Mixture and 1 Syrup.
In addition, Orange-peel or its preparations enters into 3 Tinctures, 2 Wines, 1 Infusion, 1 Spirit, 1 Mixture, 1 Confection, and 2 Syrups.

2. Citrus Medica, *var.* B. Limonum (Lemon).

The outer part of the pericarp of the fruit—— Tincture 1 in 4 and Syrup.
The oil from the same——Enters into 1 Liniment, 1 Tincture, and 1 Spirit.
The freshly expressed juice of the ripe fruit——Syrup. Citric Acid.

3. Citrus, various species.

Used as a source of Citric Acid.

Berberidaceæ

Podophyllum peltatum (May Apple).
The dried rhizome and rootlets——Resin; Tincture, 2 grs. Resin in 1 dr. (This is also classed under Ranunculaceæ.)

Burseraceæ. (See Amyridaceæ.)

Camelliaceæ or Ternstrœmiaceæ

Camellia Thea (Tea Plant).
The dried leaves——Caffeine, Caffeine Citrate, and Effervescent Citrate.

Cannabinaceæ

1. Cannabis sativa (Indian Hemp).

The dried flowering or fruiting tops of the female plants grown in India, and from which the resin has not been removed.
Extract ; and Tincture 1 in 20, which enters into Tr. Chlorof. et Morph.

2. Humulus Lupulus (Hop).

The dried strobiles from cultivated plants.
Lupulin, Infusion, 1 in 20 ; Tincture 1 in 5.

Caprifoliaceæ

Sambucus nigra (Elder).

The fresh flowers separated from the stalks——Water, 10 lbs. to 1 gallon.

Celastraceæ

Euonymus atropurpureus (Wahoo).

The *dry* extract from the root bark.

Cinchonaceæ or Rubiaceæ

1. Psychotria Ipecacuanha (Ipecacuanha or Hippo).

The dried root——Lozenge ¼ gr. in each ; Lozenge of I. and Morphine $\frac{1}{12}$ gr. each ; Compound Powder 1 in 10 ; I. and Squill Pill, 1 in 20 ; and Liquid Extract (= 2 to 2·25% alkaloids) from which are prepared Wine 1 in 20, and Vinegar 1 in 20.

2. Various species of Cinchona, and

3. Of Remijia may be used for obtaining the Salts of Quinine.

4. Cinchona succirubra (Red Cinchona).

The dried bark of the stem and branches of cultivated plants.
Liquid Extract (= 5% alkaloids); Acid Infusion 1 in 20 ; Tincture 1% alkaloids ; Compound Tincture 1 in 10.

☞ In all the Galenical preparations the *red* bark only is permitted, and it may also be used as the source of Quinine Salts. Quinine enters into 2 Tinctures, 1 Wine, 1 Scale Preparation, and 1 Pill.

5. Coffea arabica (Coffee).

The dried seeds, used for obtaining Caffeine

6. Uncaria Gambier (Catechu or Pale Catechu).

An extract of the leaves and young shoots ——Tincture 1 in 5 ; Lozenge 1 gr. in each ; Compound Powder 1 in 2½.

Compositæ

1. Anacyclus Pyrethrum (Pellitory).

The dried root——Tincture 1 in 5.

2. Anthemis nobilis (Chamomile).

The dried expanded flower heads from cultivated plants.
Extract and Oil.

3. Arnica montana (Arnica).

The dried rhizome and rootlets——Tincture 1 in 20.

4. Artemisia maritima, *var.* Stechmanniana (Santonica).

The dried unexpanded flower heads or capitula, yielding Santonin. Lozenges 1 gr. in each.

5. Taraxacum officinale (Dandelion).

(*a*) The *fresh* roots collected in autumn——Extract.
(*b*) The *juice* from the above.
(*c*) The *dried* roots collected in autumn——Liquid Extract 1 in 1.

Coniferæ

1. Juniperus communis (Juniper).

The oil distilled from the full-grown unripe green fruit.
Spirit 1 in 20. Enters into Creosote Mixture.

2. Juniperus oxycedrus and some other species.

The oily liquid **(Oil of Cade)** obtained by the destructive distillation of the woody portions.

3. Pinus palustris (Pitch Pine).

4. Pinus sylvestris (Scotch Fir).

5. Pinus Tæda (Frankincense Pine).

(*a*) The distilled and rectified oil **(Oil of Turpentine)** from the Oleo-Resin (Turpentine) obtained from P. sylvestris and other species.
Liniment 13 in 20; Acetic Liniment 4 in 9.
(*b*) The residue **(Resin)** left after the distillation of the above.
Plaster 1 in 9½; Ointment 1 in 3¾. Also enters into 7 Plasters.
(*c*) A bituminous liquid **(Stockholm Tar)** obtained from the wood of P. sylvestris and other species by destructive distillation.——Ointment 5 in 7.
(*d*) The Concrete Turpentine **(Frankincense)** scraped off the trunks of P. palustris and P. Tæda——Enters into Pitch Plaster

6. Abies balsamea (Balsam Fir).

The Turpentine **(Canada Turpentine)** obtained from above.
Enters into Flexible Collodion.

7. Pinus Pumilio (Pumilio Pine).

The oil distilled from the fresh leaves.

8. Picea excelsa (Spruce).

The resinous exudation **(Burgundy Pitch)** from the stem, melted and strained——Enters into Pitch Plaster 1 in 2.

Convolvulaceæ

1. Convolvulus Scammonia (Scammony).

(*a*) The gum-resin, obtained by incising the living root——Resin.
(*b*) The dried root, from which the resin is chiefly made, which enters into Compound Pill 1 in 3; Compound Powder 1 in 2; Compound Pill and Extract of Colocynth.

2. Ipomœa Purga (Jalap).

The dried tubercules——Extract, Tincture 1 in 5 = 1·5% resin; Compound Powder 1 in 3; Compound Scammony Powder 3 in 8; and Resin, which enters into Compound Scammony Pill.

Cruciferæ

1. Brassica alba (White Mustard).

The dried ripe seeds.

2. Brassica nigra (Black Mustard).

The dried ripe seeds.

Volatile Oil, and Compound Liniment, 1 in 27; Sinapis—the powdered seeds of white and black mustard mixed. Charta.

3. Cochlearia Armoracia (Horseradish).

The fresh roots from cultivated plants——Compound Spirit 1 in 8.

Cucurbitaceæ

1. Citrullus Colocynthis (Colocynth or Bitter Apple).

The dried pulp of the fruit freed from seeds——Compound Pill 1 in 6; Pill with Hyoscyamus 1 in 9; Compound Extract 1 in $4\frac{1}{2}$.

2. Ecballium Elaterium (Squirting Cucumber).

Elaterium (the sediment from the juice of the fruit), Elaterin (the active principle of Elaterium), Compound Powder 1 in 40.

Cupuliferæ or Corylaceæ

Quercûs infectoria.

Excrescences caused by the puncture and deposit of the eggs of Cynips Gallæ tinctoriæ——Ointment 1 in 5; Ointment with Opium 1 in 5; Gallic and Tannic Acids and their preparations.

Ericaceæ

Arctostaphylos Uva-ursi (Bearberry).

The dried leaves——Infusion 1 in 20.

Erythroxylaceæ

Erythroxylum Coca and its varieties (Coca).

The dried leaves.

Liquid Extract 1 in 1; Cocaine; Ointment 1 in 25; Hydrochloride of Cocaine; Discs $\frac{1}{50}$ gr. in each; Hypodermic Injection 10 grs. in 110 mins.; Lozenge with Krameria $\frac{1}{20}$ gr. in each.

Euphorbiaceæ

1. Croton Eluteria (Cascarilla).

The dried bark——Infusion 1 in 20; Tincture 1 in 5.

2. Croton Tiglium (Purging Croton).

The oil expressed from the seeds——Liniment 1 in 8.

3. Hevea brasiliensis, and probably other species (Caoutchouc).

The prepared milk juice—— Solution 1 in 20. In Charta Sinapis.

4. Ricinus communis (Castor Oil Plant).

The oil expressed from the seeds——Mixture 3 in 8.

Enters into 1 Collodion, 1 Liniment, and 1 Pill.

Filices

Aspidium Filix-mas (Male Fern).

The rhizome, collected late in autumn, divested of its roots, leaves, and dead matter, and carefully dried——Liquid Extract.

Fungi

Claviceps purpurea (Ergot).

The sclerotium (mycelium or spawn) originating in the ovary of Secale cereale (Common Rye).

Extract; Hypodermic Injection 10 in 33; Liquid Extract 1 in 1; Infusion 1 in 20; Ammoniated Tincture 1 in 4.

Gentianaceæ

1. Gentiana lutea (Gentian).

The dried rhizome and roots——Extract, Infusion 1 in 80; Compound Tincture 1 in 10.

2. Swertia Chirata (Chiretta).

The dried plant, collected when in flower.

Infusion 1 in 20; Tincture 1 in 10; Concentrated Solution 1 in 2.

Graminaceæ

1. Oryza sativa (Rice).

Used as a source of Starch.

2. Secale cereale (Common Rye).

The spawn of the fungus (Claviceps purpurea) originating in the ovary. (See Fungi.)

3. Triticum sativum (Wheat).

Used as a source of Starch.

4. Zea Mays (Maize or Indian Corn).

Used as a source of Starch.

Guttiferæ

Garcinia Hanburii (Gamboge).

The gum-resin——Compound Pill 1 in 6.

Hamamelidaceæ

Hamamelis virginiana (Witch Hazel).

The dried bark——Tincture 1 in 10.

The dried leaves——Liquid Extract 1 in 1; Ointment 1 in 10.

The fresh leaves——Solution 1 in 1.

Iridaceæ

Crocus sativus (Saffron).

The dried stigmas and tops of the styles——Tincture 1 in 20.

Enters into 1 Decoction and 1 Tincture.

Labiatæ

1. Lavandula vera (Lavender).

The oil distilled from the flowers——Spirit 1 in 10; Compound Tincture 45 minims to 1 pint. Enters into 1 Liquor and 1 Liniment.

2. Mentha arvensis *vars.* piperascens et glabrata.

The oil distilled from the fresh herb is used as a source of Menthol.

3. Mentha piperita (Peppermint).

The oil distilled from the fresh flowering herb.

Water 77 mins. to 1 gallon; Spirit 1 in 10, and Menthol.

Enters into 1 Pill and 1 Tincture.

4. Mentha viridis (Spearmint).

The oil distilled from the fresh flowering herb.

Water 77 mins. to 1 gallon.

5. Monarda punctata (Horsemint).

The volatile oil——Used as a source of Thymol.

6. Rosmarinus officinalis (Rosemary).
The oil distilled from the flowering tops——Spirit 1 in 10.
Enters into Soap Liniment and Compound Tincture of Lavender.

7. Thymus vulgaris (Garden Thyme).
The volatile oil——Used as a source of Thymol.

Lauraceæ

1. Cinnamomum Camphora (Camphor).
A white crystalline substance obtained from the wood.
Water ½ gr. in 1 oz.; Liniment 1 in 5; Ammoniated Liniment 1 in 8; Spirit 1 in 10; Compound Tincture 1½ grs. in 1 oz.
Also enters into 1 Ointment and 9 Liniments.

2. Cinnamomum zeylanicum (Ceylon Cinnamon).
The dried inner bark of shoots from the truncated stocks of the cultivated tree from Ceylon——Oil; Spirit 1 in 10; Water 1 in 10; Compound Powder 1 in 3; Tincture 1 in 5.
Cinnamon or its preparations also enters into 4 Mixtures, 2 Pills, 3 Powders 3 Tinctures, 1 Acid, 1 Decoction, and 2 Syrups.

3. Sassafras officinale (Sassafras).
The dried root reduced to chips or shavings.
Enters into Concentrated Compound Solution of Sarsaparilla.

Leguminosæ

1. Acacia Senegal and other species (Acacia).
A gummy exudation from the stems and branches.
Mucilage 4 and 6. Enters into 1 Pill, 2 Powders, and all the Lozenges. Mucilage enters into Mist. Ol. Ricini.

2. Andira Araroba (Araroba).
A substance found in cavities in the trunk——Chrysarobin and its Ointment 1 in 25.

3. Astragalus gummifer, and other species (Syrian Tragacanth).
A gummy exudation from the stem.
Glycerin 1 in 5; Compound Powder 1 in 6; Mucilage 60 grs. in 10 ozs.
Also enters into 1 Compound Powder, 1 Confection, 1 Lotion, and 2 Mixtures.

4. Cassia acutifolia (Alexandrian Senna).

5. Cassia angustifolia (East Indian or Tinnivelly Senna).
The dried leaflets.
Confection 1 in 11; Infusion 1 in 10; Syrup 1 in 2; Compound Tincture 1 in 5; Concentrated Solution 1 in 1; and Co. Mixture. Also enters into Compound Liquorice Powder.

6. Cassia Fistula (Purging Cassia).
The pulp from the pods. Enters into Confection of Senna.

7. Copaifera Lansdorfii (Copaiba or Copaiva).
The oleo-resin from the trunk, and the oil distilled from it.

8. Cytisus scoparius (Broom).
The *fresh* and *dried* tops——Infusion 1 in 10 (dried tops).
The juice from the fresh tops.

9. Glycyrrhiza glabra (Liquorice).
The peeled root and peeled subterranean stem——Extract, Liquid Extract, Compound Powder 1 in 6. Also enters into 1 Mixture, 1 Decoction, 1 Tincture, 1 Confection, and 1 Pill.

10. Hæmatoxylon campechianum (Logwood).
The heart-wood——Decoction 1 in 20.

11. Myroxylon Pereiræ (Peru).
A balsam exuding from the trunk after the bark has been beaten and scorched.

12. Myroxylon Toluifera (Tolu).
A balsam exuding from the trunk——Tincture 1 in 10; Syrup 1 in 29. Enters into 1 Compound Tincture, 2 Lozenges, and 1 Mixture.

13. Physostigma venenosum (Calabar Bean).
The dried seed——Extract, Physostigmine Sulphate or Eserine Sulphate and Discs, $\frac{1}{1000}$ gr.

14. Pterocarpus Marsupium (Kino).
The juice from the trunk evaporated to dryness——Tincture 1 in 10; Compound Powder 3 in 4. Enters into Compound Catechu Powder.

15. Pterocarpus santalinus (Red Sanders or Sandal Wood).
The heart-wood. Enters into Compound Tincture of Lavender.

16. Tamarindus indica (Tamarind).
The fruit freed from the brittle outer parts and preserved with sugar. Enters into Confection of Senna.

Lichenes

Roccella—various species—(Dyer's weed or Litmus).
Solution and Papers, introduced into B.P. Appendix for testing.

Liliaceæ

1. Aloe vera and A. chinensis, and probably other species (Barbados Aloes).
The juice which flows from the transversely cut leaves evaporated to dryness, imported from the Dutch West Indies.
Compound Decoction 4 grs. to 1 oz.; Extract; Pill 1 in 2; Pill with Iron 1 in $4\frac{1}{2}$; Tincture 1 of Ext. in 40; Gamboge Pill 1 in 6; Colocynth Pill 1 in 3; do. with Hyoscyamus 1 in $4\frac{1}{2}$; Compound Extract of Colocynth 1 in $2\frac{1}{4}$. Aloin.

2. Aloe Perryi, and probably other species (Socotrine Aloes).
The juice from the transversely cut leaves evaporated to dryness, imported by way of Bombay and Zanzibar.
Pill 1 in 2; Rhubarb Pill 1 in 6; Pill with Asafetida 1 in 4; Pill with Myrrh 1 in 2; Friar's Balsam 1 in 60. Aloin.

3. Urginea Scilla (Squill).
The bulb divested of its outer scales sliced and dried.
Acetum 1 in 8; Oxymel; Syrup 1 in 17; Tincture 1 in 5; Compound Pill 1 in 4; Pill with Ipecac.

Linaceæ

Linum usitatissimum (Flax).
The dried ripe seeds——Oil.
The dried ripe seeds crushed.

Erythroxylon Coca is sometimes classed under this order. See Erythroxylaceæ.

Liquidambaraceæ or Altingiaceæ

Liquidambar orientalis (Storax Tree).
A balsam obtained from the trunk——Enters into Friar's Balsam.

Storax has been placed also under the Styracaceæ, Balsamifloræ, and Hamamelidaceæ, which latter order is often made to include the Liquidambaraceæ.

Lobeliaceæ

Lobelia inflata (Lobelia).

The dried flowering herb——Ethereal Tincture 1 in 5.

Loganiaceæ or Apocynaceæ

1. Gelsemium nitidum (Yellow Jasmine).

The dried rhizome and roots——Tincture 1 in 10.

2. Strophanthus Kombé (The Kombé).

The dried ripe seeds freed from the awns——Tincture 1 in 40; Extract 1 in 2.

3. Strychnos Nux-vomica (Nux Vomica).

The dried ripe seeds——Extract 5% Strychnine; Liquid Extract 1½ grs. Strychnine in 110 mins.; Tincture 2 of liq. ext. in 12 = ¼ gr. Strychnine in 110 mins.

Strychnine; Strychnine Hydrochloride and Solution of Strychnine 1 gr. in 110 mins.

Magnoliaceæ

Illicium verum (Star-Anise).

The oil distilled from the fruit——Spirit 1 in 10.

Malvaceæ

Gossypium barbadense and other species (Cotton).

The hairs of the seed freed from fatty matter——Cotton.

Enters into Pyroxylin, which enters into 3 Collodions.

Melanthaceæ

1. Colchicum autumnale (Meadow Saffron).

(a) The fresh corm collected in early summer.
Extract.

(b) The corm stripped of its coats, sliced and dried unde 150°.
Wine 1 in 5.

(c) The dried ripe seeds.
Tincture 1 in 5.

2. Schœnocaulon officinale (Cevadilla).

The dried ripe seeds——Used for obtaining Veratrine. Ointment 1 in 50.

Menispermaceæ

1. Anamirta paniculata.

Picrotoxin——A neutral principle from the seeds.

2. Chondrodendron tomentosum (Pareira).

The dried root——Liquid Extract.

3. Jateorhiza Columba (Calumba).

The dried root, sliced——Infusion 1 in 20; Tincture 1 in 10; and Concentrated Solution 1 in 2.

Moraceæ (Sometimes regarded as a sub-order of Urticaceæ).

Ficus Carica (Figs).

The dried fleshy receptacles——Enters into Confection of Senna.

Myristicaceæ

Myristica fragrans (Nutmeg).

The dried seed divested of its testa.

Oil, and Spirit 1 in 10.

Enters into 2 Powders, 2 Spirits, 1 Pill, 2 Tinctures, and 1 Mixture.

Myrtaceæ

1. Eucalyptus Globulus (Eucalyptus or Blue Gum) and other species.

The oil distilled from the fresh leaves——Ointment 1 in 10.

2. Eucalyptus rostrata (Red Gum) and other species.

The ruby exudation from the bark. Lozenges 1 grain each.

3. Eugenia caryophyllata (Cloves).

The dried flower-bud——Oil, Infusion 1 in 40. Also enters into 1 Infusion, 1 Powder, and 2 Pills.

4. Melaleuca Leucadendron or Melaleuca Cajuputi (Cajuput).

The oil distilled from the leaves.

Spirit 1 in 10. Enters into Croton Liniment.

5. Pimenta officinalis (Pimento).

The dried unripe full-grown fruit——Water 8 ozs. to 1 gallon, and Oil.

6. Punica Granatum (Pomegranate).

The dried bark of the stem and root——Decoction 4 ozs. to 1 pint.

Oleaceæ

Olea europæa (Olive).

The oil expressed from the ripe fruit.

Enters into 2 Soaps, 3 Liniments, 4 Ointments, and 4 Plasters.

Papaveraceæ

1. Papaver somniferum (White Poppy). The source of Opium.

The nearly ripe dried fruits.

2. Papaver Rhœas (Red Poppy).

The fresh petals. Syrup 1 in $3\frac{1}{2}$.

Piperaceæ

1. Piper Cubeba (Cubebs).

The dried unripe full-grown fruit——Oil, and Tincture 1 in 5.

2. Piper nigrum (Black Pepper).

The dried unripe fruit——Confection 1 in 10.

Enters into Compound Powder of Opium.

Polygalaceæ

1. Krameria argentea (Para Rhatany).
2. Krameria triandra (Peruvian Rhatany).

The dried root——Extract, Infusion 1 in 20; Tincture 1 in 5; Lozenges, and Lozenges with Cocaine 1 gr. each; and Concentrated Solution 1 in 2.

Enters into Compound Catechu Powder.

3. Polygala Senega (Senega Snake Root).

The dried root——Infusion 1 in 20; Tincture 1 in 5, and Concentrated Solution 1 in 2.

Polygonaceæ

1. Rheum officinale.
2. Rheum palmatum.
3. Probably other species.

} Rhubarb.

The rhizome or so-called root, more or less deprived of its cortex and dried in China and Thibet.

Extract; Infusion 1 in 20; Concentrated Solution 1 in 2; Syrup 1 in 15; Compound Tincture 1 in 10; Compound Pill 1 in 4; and Compound Powder 1 in $4\frac{1}{2}$.

Ranunculaceæ

1. Aconitum Napellus (Monkshood).

The dried root——Liniment 1 in 1½; Tincture 1 in 20; and Aconitine and its Ointment 1 in 50.

2. Cimicifuga racemosa (Black Snake Root).

Dried rhizome and roots——Liquid Extract 1 in 1; and Tincture 1 in 10.

3. Delphinium Staphisagria (Stavesacre).

The dried ripe seeds——Ointment 1 in 5.

4. Hydrastis canadensis (Golden Seal).

The dried rhizome and rootlets——Liquid Extract 1 in 1; Tincture 1 in 10.

5. Podophyllum peltatum (May Apple).

The dried rhizome and rootlets——Resin. Tincture, 2 grs. resin in 1 dr.

Rhamnaceæ

Rhamnus purshianus (Cascara Sagrada).

The dried bark——Extract, and Liquid Extract 1 in 1; and enters into Aromatic Syrup of Carcara, 2 in 5.

Rosaceæ

1. Brayera anthelmintica (Kousso).

The dried panicles.

2. Prunus Amygdalus *var.* amara (Bitter Almond).

The ripe seed——Yields by expression the Oil.

3. Prunus Amygdalus *var* dulcis (Sweet or Jordan Almond).

The ripe seed——Yields by expression the Oil, which enters into Spermaceti Ointment, Phosphorated Oil, and Liniment of Ammonia.

Mixture 1 in 8; Compound Powder 8 in 13.

4. Prunus domestica *var.* Juliana (Prune).

The dried drupe. In Confection of Senna.

5. Prunus Laurocerasus (Cherry-Laurel).

The fresh leaves——The water ·1 per cent. of HCN.

6. Prunus serotina (Virginian Prune).

The bark collected in autumn——Tincture 1 in 5; Syrup 3 in 20.

7. Quillaja saponaria (Quillaia or Panama Bark).

The inner bark——Tincture 1 in 20. Used in making Solution of Coal Tar.

8. Rosa damascena (Damask Rose).

The fresh flowers——Water; Distilled Oil; Ointment of Rose Water; and Rose basis for 3 Lozenges. Enters into Mist. Ferri Comp.

9. Rosa gallica (Red Rose).

The fresh and dried unexpanded petals from cultivated plants.

Acid Infusion 1 in 40; Confection 1 in 4; Syrup 1 in 17.

The Confection enters into 3 Pills.

Rubiaceæ. (See Cinchonaceæ.)

Rutaceæ

1. Barosma betulina (Buchu).

The dried leaves——Infusion 1 in 20; Tincture 1 in 5.

2. Cusparia febrifuga (Cusparia or Angostura).

The dried bark——Infusion 1 in 20. ; Concentrated Solution 1 in 2.

3. Pilocarpus Jaborandi (Jaborandi).

The dried leaflets——Liquid Extract 1 in 1; Tincture 1 in 5; Nitrate of Pilocarpine.

Salicaceæ

Various species of Salix and Populus.

The bark is employed to make Salicin.

Santalaceæ

Santalum album (Sandal Wood).

The oil distilled from the wood.

Scrophulariaceæ

Digitalis purpurea (Foxglove).

The dried leaves of plants commencing to flower.
Infusion 3 grs. to 1 oz.; Tincture 1 in 8.

Simarubaceæ

Picræna excelsa (Quassia).

The wood of the trunk and branches.
Tincture 1 in 10; Infusion 88 grs. to 1 pint; and Concentrated Solution 1 in 10.

Smilaceæ

Smilax ornata (Sarsaparilla).

The dried roots imported from Costa Rica.
Liquid Extract 1 in 1; Concentrated Compound Solution 1 in 1.

Solanaceæ

1. Capsicum minimum (Capsicum).

The dried ripe fruit——Tincture 1 in 20; Ointment 1 in $4\frac{1}{2}$. Enters into Tincture of Chloroform and Morphia.

2. Atropa Belladonna (Belladonna).

(*a*) The *fresh* leaves and branches gathered when the plant is in flower. Extract *(green)*.

(*b*) The *juice* from the above.

(*c*) The dried root collected in autumn——Liquid Extract $\frac{3}{4}$ gr. alkaloids in 110 mins. From this are prepared Alcoholic Extract 1 per cent. alkaloids; Suppository $\frac{1}{60}$ gr. alkaloids; Plaster 2 in 3 (·5 per cent. alkaloids); Liniment 1 in 2; Ointment ·6 per cent. alkaloids; and Tincture 1 in 15 (·048 to ·052 per cent. alkaloids).

From leaves or root:—Atropine and Atropine Sulphate; Liquor 1 gr. in 110 mins.; Ointment 2 per cent.; and Discs $\frac{1}{3000}$ gr.

3. Datura Stramonium (Stramonium).

The dried ripe seeds——Extract.
The dried leaves——Tincture 1 in 5.

4. Hyoscyamus niger (Henbane).

(a) The *fresh* leaves and flowers and branches collected from flowering biennial plants——Green Extract, which enters into 1 Pill.

(b) The *juice* extracted from the above.

(c) The *dried* leaves and flowering tops separated from branches——Tincture 1 in 10; Hyoscine Hydrobromide and Hyoscyamine Sulphate.

5. Various species of Scopola.

Used for obtaining Hyoscine Hydrobromide.

6. Possibly other Solanaceous Plants.

Used for obtaining Hyoscyamine Sulphate and Hyoscine Hydrobrom.

Sterculiaceæ

Theobroma Cacao (Chocolate Tree).

The concrete oil, expressed from the seeds. Enters into 6 Suppositories.

Styracaceæ or Styraceæ

1. Styrax Benzoin (Siam and Sumatra Benzoin).

2. Probably other species of Styrax.

The balsamic resin.

Compound Tincture 1 in 10; Benzoic Acid and its preparations; Benzoated Lard 1 in 33⅓. Enters into Spermaceti and various other Ointments.

Ternstrœmiaceæ. (See Camelliaceæ.)

Thymelaceæ

1. Daphne Mezereum (Mezereon).

2. Daphne Laureola (Spurge Laurel).

3. Daphne Gnidium.

The dried bark. Enters into Concentrated Compound Solution of Sarsaparilla.

Umbelliferæ

1. Carum copticum.

The volatile oil is used as a source of Thymol.

2. Carum Carvi (Caraway).

The dried fruit——Water 1 lb. to 1 gallon, and Oil. Enters into 1 Confection, 2 Tinctures, 1 Powder, and 1 Pill.

3. Conium maculatum (Hemlock).

(a) The fresh leaves and young branches of wild British plants, collected when the fruit begins to form.

The juice——Ointment 2 in 1.

(b) The dried fully developed unripe fruit——Tincture 1 in 5.

4. Coriandrum sativum (Coriander).

The dried ripe fruit——Oil. Enters into the Syrup, Confection, and Compound Tincture of Senna, and into the Syrup and Tincture of Rhubarb

5. Dorema Ammoniacum (Ammoniacum).

6. Probably other species.

The gum-resin exuding from the flowering and fruiting stem.

Mixture ¼ oz. to 8 ozs.; Plaster of A. and Mercury 12 in 15.

Enters into 2 Pills

7. Ferula fœtida (Asafetida), and

8. Probably other species.
A gum-resin from incisions in the root.
Tincture 1 in 5; Pill of Aloes and A. 1 in 4; Fetid Spirit 33 grs. to 1 oz.
Enters into Pil. Galbani Co.

9. Ferula Sumbul (Sumbul).
The dried transverse slices of the root——Tincture 1 in 10.

10. Ferula galbaniflua (Galbanum).

11. Probably other species.
Gum-resin——Compound Pill 1 in $3\frac{1}{2}$.

12. Fœniculum capillaceum (Fennel).
The dried ripe fruit of cultivated plants.
Water 1 lb. to 1 gallon. Enters into Compound Liquorice Powder.

13. Peucedanum graveolens (Dill).
The dried fruit——Water 1 lb. to 1 gallon, and Oil.

14. Pimpinella Anisum (Anise).
The dried fruit.
Oil; Water 1 lb. to 1 gallon; Spirit 1 in 10. Enters into 2 Tinctures.

☞ Star-Anise *(Illicium verum)* belongs to the Magnoliaceæ.

Valerianaceæ

Valeriana officinalis (Valerian).
The dried rhizome and roots, collected in autumn.
Ammoniated Tincture 1 in 5.

Vitaceæ

Vitis vinifera (Grape Vine).
The dried ripe fruit (Raisins) from Spain. Enters into 2 Tinctures.

Zingiberaceæ or Scitaminaceæ

1. Curcuma longa (Turmeric).
The dried rhizome——The Paper and Tincture 1 to 6 are contained in the B.P. Appendix and are used for Testing.

2. Elettaria Cardamomum (Malabar Cardamom).
The dried ripe seeds——Compound Tincture 1 in 80.
Enters into 1 Compound Extract, 2 Powders, and 2 Tinctures.
The Tincture enters into 1 Decoction and 1 Mixture.

3. Zingiber officinale (Ginger).
The scraped and dried rhizome.
Syrup 1 in 40; Tincture 1 in 10. Ginger or its Compounds also enters into 14 official preparations.

Zygophyllaceæ

1. Guaiacum officinale, or
2. Guaiacum sanctum } Lignum Vitæ.

The heart-wood.
Enters into Concentrated Compound Solution of Sarsaparilla.
The resin obtained from the stem of 1 or 2. Mixture 11 grs. to 1 oz.; Ammoniated Tincture 1 in 5; Lozenge 3 grs. in each. Enters into Compound Calomel Pill.

MATERIA MEDICA

OF THE

BRITISH PHARMACOPŒIA.

PHARMACOPŒIAL PREPARATIONS.*

THE student having obtained some idea of the general processes of Pharmacy, should now glance at the groups of the preparations; but until he has mastered the Official Remedies he cannot expect to grasp all the information contained in this part of the subject; and hence, since these groups are of vital importance, he should repeatedly turn back to them during his study of the Materia Medica.

The Aceta or Vinegars of the Pharmacopœia are three in number:—

Acetum Cantharidis—2 ozs. cantharides, 10 ozs. glacial acetic acid, and 10 ozs. water.

Acetum Ipecacuanhæ—1 oz. liq. extract of ipecacuanha, 2 ozs. alcohol (90 per cent.), and diluted acetic acid to 1 pint.

Acetum Scillæ—$2\frac{1}{2}$ ozs. squill to 1 pint diluted acetic acid.

Aquæ (The Waters—15 in number), viz.:—

Aqua Anethi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Anisi—One gal. distilled from 1 lb. fruit and 2 gals. water.

* These preparations are often called "Galenical" *(pertaining to Galen)* to distinguish them from those prepared from the extemporaneous formulæ of the physician, which are called "Magistral" *(because ordered by a magister or master of his profession).*

Aqua Aurantii Floris—The water distilled from the flowers of the bitter orange—Citrus Aurantium—as found in commerce.

Aqua Camphoræ—A solution of camphor in water, by aid of alcohol (90 per cent.), nearly ½ gr. to 1 oz.

Aqua Carui—One gal. distilled from 1 lb. of fruit and 2 gals. of water.

Aqua Chloroformi—A solution of ½ dr. chloroform in 25 ozs. water.

Aqua Cinnamomi—One gal. distilled from 1 lb. of bark and 2 gals. water.

Aqua Destillata—Perfectly pure H_2O distilled from potable water.

Aqua Fœniculi—One gal. distilled from 1 lb. fruit and 2 gals. water.

Aqua Laurocerasi—One pt. distilled from 1 lb. fresh leaves and 2½ pts. water, and made to contain ·1 per cent. real Hydrocyanic Acid.

Aqua Menthæ Piperitæ—One gal. distilled from 77 mins. oil and 1½ gals. water.

Aqua Menthæ Viridis—One gal. distilled from 77 mins. oil and 1½ gals. water.

Aqua Pimentæ—One gal. distilled from 8 ozs. pimento and 2 gals. water.

Aqua Rosæ—Distilled water of the flowers of Rosa Damascena, as found in commerce.

Aqua Sambuci—One gal. distilled from 10 lbs. fresh flowers (or an equivalent amount of the preserved flowers) and 5 gals. water.

It should be remembered that all the waters are distilled except two—Aqua Camphoræ and Aqua Chloroformi, and that their doses all range from ½ to 1 or 2 ozs., except Aqua Laurocerasi, which contains Hydrocyanic Acid, and whose dose is only ½ to 2 drachms.

Aq. Aurant. Flor. and Aq. Rosæ in commerce are saturated solutions of oil in water, and for dispensing are to be diluted, immediately before use, with twice their volume of water.

Charta (Paper—1 in number).

Charta Sinapis—The fixed oil is extracted with Benzol by percolation from black and white mustard, bruised. The residue is dried and powdered, and 75 grs. mixed with 5 fl. drs. of solution of India-rubber, and spread on cartridge paper and dried. The paper should be dipped in tepid water before use.

Collodia (Collodions—3 in number).

Collodium—Pyroxylin 1 oz., Ether 36 ozs., alcohol (90 per cent.) 12 ozs.

Collodium Flexile—Collodion 12 ozs., Canada Turpentine ½ oz., Castor Oil ½ oz.

Collodium Vesicans—Blistering Liquid 20 ozs., Pyroxylin ½ oz.

Confections (4 in number). The last two are Cathartic, the first two faintly Astringent. Confections are soft preparations of a pasty consistence, containing a medicine blended with some form of sugar, either to preserve it, or to make its administration more agreeable. Under this heading are included the old Conserves and Electuaries.

CONFECTIO.	COMPOSITION.	STRENGTH.	DOSE.
Piperis . . .	Powdered black pepper 2, powdered caraway fruit 3, clarified honey 15; mix.	1 in 10.	60 to 120 grs.
Rosæ Gallicæ	Fresh red rose petals 1, beaten with sugar 3.	1 in 4.	—
Sennæ . . .	Powdered senna 7 oz., powdered coriander 3 oz., figs 12 oz. tamarind and cassia pulp 9 oz. each, prunes 6 oz., extract of liquorice 1 oz., sugar 30 oz., water q.s. to 75 oz. Boil the figs and prunes in 24 oz. water for 4 hours; in this digest the cassia and tamarind for 2 hours; sift, add the sugar and liquorice, dissolve, add the senna and coriander, and make up to 75 ozs.	1 in 11.	60 to 120 grs.
Sulphuris. .	Sulphur 4 oz., acid potassium tartrate 1 oz., tragacanth 18 grs., syrup 2 oz., tincture of orange ½ oz., glycerin 1½ oz.	1 in 2½.	60 to 120 grs.

Decocta (Decoctions—3 in number) are watery vegetable solutions prepared by boiling. Aloes only is made in a covered vessel. All are made with distilled water and strained. Dose of each is ½ to 2 ozs.

DECOCTIONS.

DECOCTUM.	COMPOSITION.	STRENGTH.
Aloes Co.	Extract of Barbados aloes ½ oz., myrrh, saffron, and potassium carbonate, of each ½ oz., extract of liquorice 2 oz., compound tincture of cardamoms 15 oz., water q.s. to 50 oz. Boil all for 5 minutes, except the saffron and tincture, in 1 pint of water; add the saffron, and when cooled add the tincture 2 hours before straining, and make up to 50 oz. with water.	1 in 100
Granati Corticis	Pomegranate bark 4 oz., boiled in 24 oz. water for 10 minutes. Product to measure 1 pint.	1 in 5
Hæmatoxyli .	Logwood chips 1 oz., cinnamon bark 70 grs., water 24 oz., boil for 10 minutes and strain. Product 1 pint.	1 in 20

Emplastra (Plasters—12 in number) are solid, adhesive applications for external use, either for support or intended to

act as a local means of applying various active remedies. As the various ingredients are only added to the active medicine for the sake of such physical qualities as adhesiveness, softness, hardness, and the like, it is not necessary for the student to learn *their* proportions, and as the directions are complicated, and seldom required by the student of Pharmacy, who never makes them, he is referred to the name of the drug in the Materia Medica, where he will find the plasters amongst the other preparations of each remedy.

EMPLASTRUM.	ARTICLES EMPLOYED IN THE PREPARATION.	STRENGTH.
Ammoniaci *cum* Hydrargyro	Ammoniacum, mercury, olive oil, and sublimed sulphur.	1 of Hg in 5
Belladonnæ ..	Liquid extract of belladonna, evaporated to ¼ bulk, resin plaster.	2 in 3=·5 p.c. alkaloids.
Calefaciens ..	Cantharides, yellow beeswax, resin, resin plaster, soap plaster, and boiling water.	1 in 24 of Cantharides.
Cantharidis ..	Cantharides, yellow beeswax, lard, resin, and soap plaster.	1 in 3 (nearly).
Hydrargyri ..	Mercury, olive oil, sulphur, and lead plaster.	1 in 3.
Menthol ..	Menthol, yellow beeswax, and resin.	3 in 20.
Opii	Powdered opium and resin plaster.	1 in 10.
Picis	Burgundy pitch, frankincense, resin, yellow beeswax, olive oil, and water.	1 in 2.
Plumbi	Lead oxide, olive oil, and water. No strength need be given, as it is chiefly *oleate of lead*, with a little glycerin.	
Plumbi Iodidi	Lead iodide, lead plaster, and resin.	1 in 10.
Resinæ .. (Adhesive Plaster)	Resin, lead plaster, and hard soap.	1 in 9½.
Saponis ..	Hard soap, lead plaster, and resin.	1 in 7.

Extracta (Extracts—39 in number) are mostly semi-solid products, obtained by the evaporation of vegetable solutions.

There are four classes of extracts, if we divide them according to the methods directed for their preparation—

1. The Fresh or Green Extracts, as hyoscyamus, &c.
2. The Aqueous or Watery, as aloes and opium.
3. The Alcoholic, as physostigma and rhubarb.
4. The Liquid, as coca and male fern.

The student should remember that these names have no connection with the *physical qualities* of the extract, except in the case of the liquid ones. Thus, the Fresh or Green extracts are either dark brown or black in colour; the Watery extracts may be of pilular consistence like opium, or hard and brittle like aloes.

The extracts may be, however, better divided, according to their consistence, into three well-marked groups—

1. The *Semi-solid* or pilular extracts, of which there are 16.
2. The *Hard*, Dry, or Brittle, of which there are 6.
3. The *Fluid*, of which there are 17.

The Fluid extracts will be found in the table on page 161. The table on page 162 contains both the Solid and Semi-solid; but the student should remember that the Solid extracts are—Extracta Aloes Barbadensis, Krameriæ, Cascaræ Sagradæ, Rhei, Strophanthus, and Euonymi Siccum (the last two being in the form of powder).

The Fresh or Green Extracts, of which there are four—viz.: Belladonna Viride, Hyoscyamus Viride, Colchicum, and Taraxacum—are prepared by expressing the juice of the drug, heating to 130° F., to coagulate the green colouring matter. This is separated and laid aside. The fluid is heated to 200° F. to coagulate all the albumen, which is useless, and which if retained would promote the decomposition of the preparation; it is consequently rejected. The fluid resulting is evaporated by the heat of a water-bath to a syrupy state. The colouring, previously separated and passed through a hair-sieve is now added, and the evaporation continued below 140° till the consistence of a soft extract is reached. In the case of Colchicum and Dandelion the juice is at first heated to the boiling point, and maintained at this temperature for ten minutes, to coagulate the albumen, filtered and evaporated at a temperature under 160°.

The Watery Extracts (7 in number) are prepared by boiling, macerating, or infusing the substance in hot or cold distilled water, and evaporating the resulting decoction, infusion, or solution to a suitable consistence. Thus Aloes Barb. is made by exhausting with *boiling* water. Chamomile is made by first boiling, hence it is an evaporated *decoction*, to which a little essential oil is added. Liquorice and Opium are aqueous extracts prepared by maceration of the drug in *cold* water; but the Liquorice infusions after being strained are boiled, and again strained before evaporation. Cascara Sagrada and Krameria are exhausted by percolation, and Gentian is first infused in *cold* water and afterwards boiled.

The Alcoholic Extracts (11 in number) are prepared by treating the substance with alcohol of different strengths, and the subsequent evaporation of the tincture thus produced. The student should note that there are *two semi-solid* extracts of Belladonna, one a Green or Fresh extract and the other prepared from the liquid extract and known as the Alcoholic extract. Nux Vomica also is prepared from its liquid extract, Sugar of Milk being added to each of them to give a definite alkaloidal strength.

Liquid Extracts (17 in number) are either Alcoholic extracts dissolved in spirit and water, or *concentrated* infusions of drugs, to which enough spirit is added for their preservation. Opium is made from its semi-solid extract.

EXTRACTUM.	MATERIALS USED.	Strength.	DOSE.
Belladonnæ Liq.	Belladonna root, alcohol (90%), and water.	0·75 % alkaloids.	—
Cascaræ Sagradæ Liq.	Cascara sagrada, water and alcohol (90%).	1 in 1.	½ to 1 dr.
Cimicifugæ Liq.	Cimicifuga and alcohol (90%).	1 in 1.	5 to 30 min.
Cinchonæ Liq.	Red cinchona bark, hydrochloric acid, glycerin, alcohol (90%), and water.	1 in 1, or 5% alkaloids.	5 to 15 min.
Cocæ Liq.	Coca leaves and alcohol (60%).	1 in 1.	½ to 1 dr.
Ergotæ Liq.	Ergot, water, and alcohol (90%).	1 in 1.	10 to 30 min.
Filicis Liq.	Male fern (dried rhizome), and ether.	10 yield 1.	45 to 90 min.
Glycyrrhizæ Liq.	Liquorice root, water and alcohol (90%).	S.G. 1·20.	½ to 1 dr.
Hamamelidis Liq.	Hamamelis leaves and alcohol (45%).	1 in 1.	5 to 15 min.
Hydrastis Liq.	Hydrastis rhizome and alcohol (45%).	1 in 1.	5 to 15 min.
Ipecacuanhæ Liq.	Ipecacuanha root, slaked lime, and alcohol (90%).	2 to 2·25% alkaloids.	½ to 2 min. as an expectorant; 15 to 20 min. as an emetic.
Jaborandi Liq.	Jaborandi leaves and alcohol (45%).	1 in 1.	5 to 15 min.
Nucis Vomicæ Liq.	Nux Vomica seeds, alcohol (70%), and alcohol (90%)	1·5% strychnine	1 to 3 min.
Opii Liq.	Extract of opium, water and alcohol (90%).	¾ in 20. ·7 to ·8% morphine.	5 to 30 min.
Pareiræ Liq.	Pareira root, boiling water, and alcohol (90%).	25% extractives.	½ to 2 drs.
Sarsæ Liq.	Sarsaparilla, alcohol (20%), and glycerin.	1 in 1.	2 to 4 drs.
Taraxaci Liq.	Dry dandelion root, alcohol (60%), and water.	1 in 1.	½ to 2 drs.

Abstracts are alcoholic extracts mixed with an inert powder, evaporated to dryness and powdered. They are not mentioned in the B.P., but the Dry Extract of Euonymus and Extract of Strophanthus are abstracts.

EXTRACTUM.	SOURCE.	MENSTRUUM USED.	DOSE.
Aloes Barb.	Barbados aloes, in fragments.	Boiling water.	1 to 4 grs.
Anthemidis	The dried flowers and essential oil.	Do.	2 to 8 grs.
Bellad. Alcohol. ..	Liquid extract of belladonna.	Sugar of milk.	$\frac{1}{4}$ to 1 gr.
Belladonnæ Viride	Juice of the fresh leaves and young branches.	None.	$\frac{1}{4}$ to 1 gr.
Cannabis Indicæ..	The dried flowering tops.	Alcohol (90°/$_o$).	$\frac{1}{4}$ to 1 gr.
Cascaræ Sagradæ	The powdered bark. ..	Cold water.	2 to 8 grs.
Colchici	Juice of the fresh corms.	None.	$\frac{1}{4}$ to 1 gr.
Colocynth. Comp..	Pulp of colocynth, extract of Barbados aloes, scammony resin, curd soap, and cardamoms.	Alcohol (60°/$_o$).	2 to 8 grs.
Ergotæ	Sclerotium	Alcohol (60°/$_o$), water, diluted hydrochloric acid, and sodium carbonate.	2 to 8 grs.
Euonymi Siccum..	The powdered bark.	Alcohol (45°/$_o$) and calcium phosphate.	1 to 2 grs.
Gentianæ..	The sliced root, dried.	Cold water.	2 to 8 grs.
Glycyrrhizæ .. .	The dried powdered root.	Cold water.	—
Hyoscyami Viride	Juice of fresh leaves and branches.	None.	2 to 8 grs.
Jalapæ	The dried powdered root.	Alcohol (90°/$_o$) and water.	2 to 8 grs.
Krameriæ	The dried powdered root.	Cold water.	5 to 15 grs.
Nucis Vomicæ ..	Liquid extract of nux vomica. (5% strychnine)	Sugar of milk.	$\frac{1}{4}$ to 1 gr.
Opii	Opium sliced.	Cold water.	$\frac{1}{4}$ to 1 gr.
Physostigmatis ..	The dried powdered bean.	Alcohol (90°/$_o$) and milk sugar.	$\frac{1}{4}$ to 1 gr.
Rhei	The dried powdered root.	Alcohol (60°/$_o$).	2 to 8 grs.
Stramonii	The dried, coarsely powdered seeds.	Alcohol (70°/$_o$).	$\frac{1}{4}$ to 1 gr.
Strophanthi	The seeds coarsely powdered and dried at 110° F.	Purified ether alcohol (90°/$_o$), and milk sugar.	$\frac{1}{4}$ to 1 gr.
Taraxaci	The juice of the fresh root	None.	5 to 15 grs.

No extract has now a maximum dose less than 1 gr. Nine are $\frac{1}{4}$ to 1 gr.—namely, Alcoholic and Green Belladonna, Indian Hemp, Colchicum, Nux Vomica, Opium, Calabar Bean, Stramonium, and Strophanthus. The Pharmacopœia gives no doses for Extracta Bellad. Liq. and Glycyrrhizæ.

Glycerina (Glycerins—9 in number) are solutions of the drug bearing the name, in glycerin or in glycerin and water.

The fact of the solid constituents being weighed, and the fluid ones being measured, leads to difficulties in stating accurately their strengths.

GLYCERINS.

GLYCERINUM.	INGREDIENTS.	Strength by Weight.	Strength by Volume.
Acidi Borici ..	Boric acid and glycerin.	6 in 20.	6 in 16.
Acidi Carbolici ..	Phenol and glycerin.	1 in $6\frac{1}{4}$.	1 in 5.
Acidi Tannici ..	Tannic acid and glycerin.	1 in $6\frac{1}{4}$.	1 in 5.
Aluminis	Alum, glycerin, and water.	1 in $7\frac{1}{2}$.	1 in 6.
Amyli	Starch, glycerin, and water.	1 in 10.	1 in 9.
Boracis	Borax and glycerin.	1 in $8\frac{1}{2}$.	1 in $6\frac{3}{4}$.
Pepsini	Pepsin, hydrochloric acid, glycerin, and water.	—	5 grs. in 1 dr.
Plumbi Subacetatis	Lead acetate and oxide, glycerin and water. Evaporated to $32\frac{3}{4}$ oz., by weight.	1 in 6.	1 in 4
Tragacanthæ ..	Tragacanth, glycerin, and water.	1 in $5\frac{1}{4}$.	—

Infusa (Infusions—22 in number) are watery solutions of vegetable principles prepared without boiling. 20 are prepared by pouring boiling distilled water on the vegetable properly comminuted, and placed in a suitable pot with a covered lid, and allowed to stand a definite short time.

Two—Quassia and Calumba—are prepared with cold water. All will darken on the addition of persalts of iron, except Quassia and Calumba, and all should be prepared fresh. All are directed to be strained. The product should not be made to measure any particular quantity. All infusions are made with 1 pint water. The most important infusion for the student to remember is Digitalis. It contains 60 grs. to a pint, and the dose is only two to four drachms. 14 are made with 1 oz. of the vegetable; 3—Compound Orange, Caryophylli, and Acid Rose—with $\frac{1}{2}$ oz.; 1—Compound Gentian—with $\frac{1}{4}$ oz.; 2—Broom and Senna—with 2 ozs.; and Quassia with 88 grs. All the infusions are to stand for $\frac{1}{4}$ of an hour except Calumba and Senega ($\frac{1}{2}$ hour), and Cinchona Acidum (1 hour).

INFUSIONS.

INFUSUM.	INGREDIENTS.	STRENGTH.	TIME.	DOSE.
Aurantii ..	Dried bitter-orange peel cut small & boiling water.	1 in 20	¼ hour.	½ to 1 oz.
Aurantii Co.	Dried bitter-orange peel cut small, fresh lemon peel cut small, cloves bruised, & boiling water.	1 in 40	¼ hour.	½ to 1 oz.
Buchu	Leaves freshly broken and boiling water.	1 in 20	¼ hour.	½ to 1 oz.
Calumbæ ..	Root thinly sliced and *cold* water.	1 in 20	½ hour.	½ to 1 oz.
Caryophylli	Cloves bruised and boiling water.	1 in 40	¼ hour.	½ to 1 oz.
Cascarillæ ..	Bark powdered and boiling water.	1 in 20	¼ hour.	½ to 1 oz.
Chiratæ ..	Chiretta cut small and boiling water.	1 in 20	¼ hour.	½ to 1 oz.
Cinch. Acid...	Red bark powdered, aromatic sulphuric acid, and boiling water.	1 in 20	1 hour.	½ to 1 oz.
Cuspariæ ..	Bark powdered and boiling water.	1 in 20	¼ hour.	1 to 2 oz.
Digitalis ..	Leaves powdered and boiling water.	60 grs. in 1 pt. or 1 in 160	¼ hour.	2 to 4 drs
Ergotæ	Ergot freshly crushed and boiling water.	1 in 20	¼ hour.	1 to 2 oz.
Gentianæ Co.	Root thinly sliced, dried bitter-orange peel cut small, fresh lemon peel cut small, and boiling water.	1 in 80	¼ hour.	½ to 1 oz.
Krameriæ ..	Root bruised and boiling water.	1 in 20	¼ hour.	½ to 1 oz.
Lupuli	Hops freshly broken and boiling water.	1 in 20	¼ hour.	1 to 2 oz.
Quassiæ.. ..	Wood finely rasped, *cold* water.	1 in 100	¼ hour.	½ to 1 oz.
Rhei	Root in thin slices, boiling water.	1 in 20	¼ hour.	½ to 1 oz.
Rosæ Acidum	Red-rose petals dried and broken, diluted sulphuric acid, and boiling water.	1 in 40	¼ hour.	½ to 1 oz.
Scoparii ..	Tops dried and bruised and boiling water.	1 in 10	¼ hour.	1 to 2 oz.
Senegæ	Root powdered and boiling water.	1 in 20	½ hour.	½ to 1 oz.
Sennæ	Senna, ginger sliced, and boiling water.	1 in 10	¼ hour.	½ to 1 oz.; as draught 2 oz.
Serpentariæ	Rhizome powdered and boiling water.	1 in 20	¼ hour.	½ to 1 oz.
Uvæ Ursi ..	Leaves bruised and boiling water.	1 in 20	¼ hour.	½ to 1 oz.

There are 5 Infusions which are really compound preparations, containing more than one ingredient; they are—Aurantii Co., Cinchonæ Acid., Gentianæ Co., Rosæ Acid., and Sennæ, though the student will note that the title compound is only conferred upon two of them—viz., Gentian and Orange.

Injectio Hypodermica—There are 4 preparations under this head in the Pharmacopœia. In each the vehicle is boiled and cooled before the drug is dissolved. Apomorphine and Ergot are ordered to be recently prepared.

HYPODERMIC INJECTIONS.

INJECTIO HYPODERMICA.	COMPOSITION.	STRENGTH.	DOSE, by subcutaneous injection.
Apomorphinæ	Hydrochloride of apomorphine, 1 gr.; diluted hydrochloric acid, 1 minim; water, to 110 minims.	1 gr. in 110 mins.	5 to 10 mins.
Cocainæ ..	Cocaine hydrochloride, 33 grs.; salicylic acid, ½ gr.; distilled water, to 6 fl. drs.	10 grs. in 110 mins.	2 to 5 mins.
Ergotæ ..	Extract of Ergot, 100 grs.; Phenol, 3 grs.; water, to 330 mins.	33 grs. in 110 mins.	3 to 10 mins.
Morphinæ ..	Morphine tartrate, 50 grs.; water, q.s. to 1,100 mins.	5 grs. in 110 mins.	2 to 5 mins.

Lamellæ (Discs) are 4 in number—

Lamellæ Atropinæ—Discs of gelatin and some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{5000}$ gr. atropine sulphate.

Lamellæ Cocainæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{50}$ gr. cocaine hydrochloride.

Lamellæ Homatropinæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{100}$ gr. of homatropine hydrobromide.

Lamellæ Physostigminæ—Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{1000}$ gr. physostigmine sulphate.

Linimenta (Liniments or Embrocations—15 in number) are preparations for external application to the skin, and intended to be applied with friction. They are really very thin ointments, though the majority of them are perfectly limpid liquids. The iodide of potassium with soap liniment is a soft solid—like shaving paste. All contain either a fixed or volatile oil or a soap, camphor entering into 11 of them. Those without

camphor are ammonia, lime, croton oil, and iodide of potassium with soap. The old Liniment of Iodine is now called Liquor Iodi Fortis.

LINIMENTS.

LINIMENTUM.	COMPOSITION.	STRENGTH.
Aconiti	20 oz. root, 1 oz. camphor, and alcohol (90%) to 30 oz.	1 in 1½
Ammoniæ ..	1 oz. solution of ammonia, 1 oz. almond oil, and 2 oz. olive oil.	1 in 4.
Belladonnæ ..	10 oz. liquid extract, 1 oz. camphor, 2 oz. water, and alcohol (90%) to 20 oz.	1 in 2.
Calcis	2 oz. lime water, and 2 oz. olive oil, agitated together.	1 in 2.
Camphoræ ..	1 oz. camphor, in flowers, and 4 oz. olive oil.	1 in 5.
Camphoræ Ammoniatum	2½ oz. camphor, 1 dr. oil of lavender, 5 oz. strong solution of ammonia, and alcohol (90%) to 20 oz.	1 in 8.
Chloroformi ..	2 oz. chloroform, and 2 oz. camphor liniment.	1 in 2.
Crotonis	1 oz. croton oil, and 3½ oz. each oil of cajuput and alcohol (90%).	1 in 8.
Hydrargyri ..	1 oz. of mercurial ointment, 160 mins. strong solution of ammonia, and liniment of camphor to 3 oz.	1 of oint. in 3, or 1 of Hg. in 6.
Opii	2 oz. tincture of opium, and 2 oz. soap liniment.	1 in 2.
Potassii Iodidi cum Sapone	2 oz. curd soap, 1½ oz. potassium iodide, 1 oz. glycerin, 1 dr. oil of lemon, and 10 oz. distilled water.	54½ grs. in 1 fl. oz. *or* 1 in 10 by weight.
Saponis	2 oz. soft soap, 1 oz. camphor, 3 drs. oil of rosemary, 4 oz. distilled water, and 16 oz. alcohol (90%).	1 in 12.
Sinapis	1½ dr. oil of mustard, 120 grs. camphor, 5 drs. castor oil, and 4 oz. alcohol (90%).	1 in 27.
Terebinthinæ	1½ oz. soft soap, 1 oz. camphor, 13 oz. oil of turpentine, and water to 1 pint.	13 in 20.
Terebinth. Acet.	4 oz. oil of turpentine, 1 oz. glacial acetic acid, 4 oz. camphor liniment.	4 in 9.

Liquores (Solutions—53 in number) are solutions of vegetable principles or inorganic substances, mostly in distilled water. Three—Pancreatis, Thyroidei, and Epispasticus—come from the animal kingdom. The last named is made with acetic ether. The several vegetable solutions are prepared with alcohol of various strengths.

The following 11 are all of the same strength—1 grain in 110 minims; they are most important preparations :—

Arsenicalis.	Atropinæ Sulph.	Pot. Permang.
Arsenici Hydr.	Morphinæ Tart.	Strychninæ Hydr.
Arsenii et Hyd. Iod.	Morphinæ Hydr	Trinitrini
Sodii Arsen.	Morphinæ Acet	

LIQUORS OR SOLUTIONS.

LIQUOR.	STRENGTH.	DOSE.
Acid. Chromici	25 p. cent. anhydrous.	Used externally.
Ammoniæ	1 in 3. (10 per cent.)	Used externally.
Ammoniæ Fortis	32·5 per cent.	Used externally.
Ammonii Acetatis	about 6½ per cent.	2 to 6 drs.
Ammonii Citratis	nearly 16 per cent.	2 to 6 drs.
Arsenicalis	1 gr. in 110 mins.	2 to 8 m.
Arsenici Hydrochloricus	1 gr. in 110 mins.	2 to 8 m.
Arsenii et Hydrg. Iod.	1 gr. in 110 mins.	5 to 20 m.
Atropinæ Sulphatis	1 gr. in 110 mins.	½ to 1 m.
Bismuthi et Ammon. Cit.	about 3 grs. oxide in 1 dr.	½ to 1 dr.
Calcis	½ gr. in 1 oz.	1 to 4 oz.
Calcis Chlorinatæ	about 3 per cent. Cl. when fresh.	—
Calcis Saccharatus	about 8 grs. in 1 oz.	20 to 60 m.
Calumbæ Conc.	1 in 2.	½ to 1 dr.
Caoutchouc	1 to 20.	Used externally.
Chiratæ Conc.	1 in 2.	½ to 1 dr.
Cuspariæ Conc.	1 in 2.	½ to 1 dr.
Epispasticus	1 in 2.	Used externally.
Ethyl Nitritis	2½ to 3 per cent.	20 to 60 m.
Ferri Acetatis	almost 10 per cent.	5 to 15 m.
„ Perchloridi	1 in 4.	5 to 15 m.
„ „ Fortis	1 oz. iron in 5.	—
„ Pernitratis	1 oz. iron in 30.	5 to 15 m.
„ Persulphatis	36 per cent.	—
Hamamelidis	1 in 1.	Used externally.
Hydrargyri Nit. Acidus	48 per cent.	Used externally.
Hydrargyri Perchloridi	½ gr. in 1 oz.	½ to 1 dr.
Hydrogenii Peroxidi	10 of oxygen in 1.	½ to 2 drs.
Iodi Fortis	1 in 9.	Used externally.
Krameriæ Conc.	1 in 2.	½ to 1 dr.
Magnesii Carbonatis	nearly 10 grs. in 1 oz.	1 to 2 oz.
Morphinæ Acetatis	1 gr. in 110 mins.	10 to 60 m.
Morphinæ Hydrochloridi	1 gr. in 110 mins.	10 to 60 m.
Morphinæ Tartratis	1 gr. in 110 mins.	10 to 60 m.
Pancreatis	1 in 4.	—
Picis Carbonis	1 in 6.	Used externally.
Plumbi Subacetatis Fortis	24 per cent.	Used externally.
„ „ Dilutus	1 in 80.	Used externally.
Potassæ	27 grs. in 1 oz.	10 to 30 m.
Potassii Permanganatis	1 gr. in 110 mins.	2 to 4 drs.
Quassiæ Conc.	1 in 10.	½ to 1 dr.
Rhei Conc.	1 in 2.	½ to 1 dr.
Sarzæ Co. Conc.	1 in 1.	2 to 8 drs.
Senegæ Conc.	1 in 2.	½ to 1 dr.
Sennæ Conc.	1 in 1.	½ to 1 dr.
Serpentariæ Conc.	1 in 2.	½ to 2 drs.
Sodæ Chlorinatæ	2½ per cent. Cl.	10 to 20 m.
Sodii Arsenatis	1 gr. in 110 mins.	2 to 8 m.
Sodii Ethylatis	18 per cent.	Used externally.
Strychninæ Hydrochloridi	1 gr. in 110 mins.	2 to 8 m.
Thyroidei	100 mins.=1 gland.	5 to 15 m.
Trinitrini	1 gr. in 110 mins.	½ to 2 m.
Zinci Chloridi	46 grs. in 1 dr.	Used externally.

☞ The Concentrated Liquors of Calumba, Chiretta, Cusparia, Krameria, Quassia, Rhubarb, Sarsaparilla, Senega, Senna, and Serpentary, are introduced into the new B.P. as representatives of the class of "Concentrated Infusions."

Lotiones (Lotions—2 in number) are liquid preparations for external application.

Lotio Hydrargyri Flava, 20 grs. hyd. perchlor. and 10 ozs. lime water.

Lotio Hydrargyri Nigra, 30 grs. calomel, ½ oz. glycerin, 1¼ oz. mucilage of tragacanth, and lime water, to 10 ozs.

Mella (Honeys—4 in number) are preparations of honey.

Mel Depuratum—Honey melted and strained through flannel.

Mel Boracis—1 oz. powdered borax mixed with 8 ozs. clarified honey, and ½ oz. glycerin.

Oxymel—40 ozs. clarified honey, 5 ozs. acetic acid, and distilled water (about 5 ozs.) to give a S.G. of 1·32. Dose—1 to 2 drs.

Oxymel Scillæ—2½ ozs. squill, 2½ ozs. acetic acid, 8 ozs. water, macerated for 7 days, and the product mixed with clarified honey, liquefied (about 27 fluid ozs.), to give S.G. 1·32. Dose—½ to 1 dr.

Misturæ (Mixtures—9 in number).

MISTURA.	COMPOSITION.	STRENGTH PER OZ.
Ammoniaci ..	¼ oz. ammoniacum rubbed up with 7½ oz. water, and 4 drs. syrup of tolu, and strained.	13½ grs.
Amygdalæ ..	2 oz. compound powder of almonds and 16 oz. water, and strained.	54 grs.
Creosoti	16 minims each creosote and spirit of juniper, 1 oz. syrup, & water to 16 oz.	1 minim.
Cretæ..	¼ oz. prepared chalk, 15 grs. tragacanth in powder, ½ oz. sugar, and cinnamon water to 8 oz.	13½ grs.
Ferri Comp. ..	25 grs. ferrous sulphate, 30 grs. potassium carbonate, 60 grs. each myrrh and sugar, 50 mins. spirit of nutmeg, rose water to 10 oz.	2½ grs.
Guaiaci	½ oz. guaiacum resin, ½ oz. sugar, 35 grs. tragacanth powdered, and 1 pt. cinnamon water.	11 grs.
Olei Ricini ..	3 oz. castor oil, 1½ oz. mucilage of acacia, 1 oz. orange flower water, and 2½ oz. cinnamon water.	3 drs.
Sennæ Co. ..	5 oz. magnesium sulphate, 1 oz. liq. extract of liquorice, 1 oz. aromatic spirit of ammonia, 2 oz. compound tincture of cardamoms, infusion of senna to 1 pint.	¼ oz. mag. sulph.
Spt. Vini Gallici	4 oz. each brandy and cinnamon water, the yolks of 2 eggs, ½ oz. sugar.	3 drs.

The formula of each of the official mixtures may be regarded as a carefully-written recipe in which a mixture is ordered, the ingredients being mostly in suspension. The dose is the same for all—from ½ to 1 or 2 ozs.

The Mistura Sennæ Co. is the official representative of "Black Draught," and may be more correctly regarded as a magnesium sulphate preparation, with the infusion of senna added as an adjuvans.

Mucilagines (Mucilages—2 in number) are watery solutions of a gum.

Mucilago Acaciæ—4 ozs. gum acacia dissolved in 6 ozs. distilled water after rinsing with water.

Mucilago Tragacanthæ—60 grs. of the powdered gum mixed with 2 drs. alcohol (90 per cent) and distilled water added to make 10 ozs.

These preparations are of no therapeutical interest, being merely introduced as excipients or vehicles with the intention of being prescribed in mixtures containing insoluble metallic salts or insoluble vegetable powders, to assist their suspension in the liquid medium. They are used as excipients in pill making, and are employed in the various methods of pill coating.

Olea (Oils).—Under this name there are 33 substances in the Pharmacopœia. They may be divided into two well-marked classes—fixed and volatile—the fixed being obtained by expression, and the volatile being products of distillation, except in the case of Ol. Limonis, a vegetable oil, which is volatile though obtained by expression. In addition to these, which are only known as oils, there are others in the pharmacopœia equally deserving the name, as camphor, which is a volatile oil; lard, wool fat, beeswax, suet, and spermaceti, which are fixed.

Of the 33 oils, one is an animal product—cod liver oil—which is a fixed oil, and, omitting lemon, six are expressed—Almond, Croton, Linseed, Olive, Castor, and Theobroma; Cade is obtained by *destructive* distillation. Theobroma is solid.

As a rule, they vary from colourlessness through straw and yellow to a pale brown, but cajuput is a deep green colour and cade is nearly black.

Cloves, cinnamon, pimento, and mustard oils *sink* in water.

The dose of each of the volatile oils is, speaking generally, about ½ to 3 minims. The oil of mustard is a powerful poison, and should only be used externally. Of the fixed oils, croton is only given in doses of ½ to 1 minim, while of the remaining five nearly an ounce each may be given.

The volatile oils are added to the official pill masses for two reasons—to correct griping, and to serve as a means of distinguishing the various pill masses from each other by their odour.

OLEUM.	SOURCE AND HOW PREPARED.	DOSE.
Amygdalæ ..	Expressed from bitter or sweet almonds.	——
Anethi	Distilled from dill fruit.	½ to 3 mins.
Anisi	Distilled from the fruit of anise or star-anise.	½ to 3 mins.
Anthemidis ..	Distilled from the flowers.	½ to 3 mins.
Cadinum	Obtained by the *destructive* distillation of the wood of juniperus oxycedrus and other species.	Used externally.
Cajuputi	Distilled from the leaves.	½ to 3 mins.
Carui	Distilled from the fruit.	½ to 3 mins.
Caryophylli ..	Distilled from the flower buds.	½ to 3 mins.
Cinnamomi ..	Distilled from cinnamon bark.	½ to 3 mins.
Copaibæ	Distilled from copaiba.	5 to 20 mins.
Coriandri ..	Distilled from the fruit.	½ to 3 mins.
Crotonis	Expressed from the seeds.	½ to 1 min.
Cubebæ	Distilled from the unripe fruit.	5 to 20 mins.
Eucalypti	Distilled from the fresh leaves.	½ to 3 mins.
Juniperi	Distilled from the unripe fruit.	½ to 3 mins.
Lavandulæ ..	Distilled from the flowers.	½ to 3 mins.
Limonis	Expressed from the fresh peel.	½ to 3 mins.
Lini	Expressed without heat from the seeds.	Used externally.
Menthæ Piperitæ	Distilled from the fresh flowering herb.	½ to 3 mins.
Menthæ Viridis	Distilled from the fresh flowering herb.	½ to 3 mins.
Morrhuæ	Extracted by a heat under 180° from the fresh liver.	1 to 4 drs.
Myristicæ ..	Distilled from the dried seeds.	½ to 3 mins.
Olivæ	Expressed from the ripe fruit.	——
Phosphoratum	Expressed oil of almonds and phosphorus, heated to 180°.	1 to 5 mins.
Pimentæ	Distilled from the unripe berry.	½ to 3 mins.
Pini	Distilled from the fresh leaves.	——
Ricini	Expressed from the seeds.	1 to 8 drs.
Rosæ	Distilled from the fresh flowers.	——
Rosmarini ..	Distilled from the flowering tops.	½ to 3 mins.
Santali	Distilled from the wood.	5 to 30 mins.
SinapisVolatile	Distilled from the black seeds, after maceration with water.	Used externally
Terebinthinæ. .	Distilled usually by aid of steam from the oleo-resin.	2 to 10 mins.; 3 to 4 drs. as anthelmintic.
Theobromatis	Expressed with heat from the ground seeds.	Not given.

Pilulæ (Pills—20 in number) are soft solid masses, capable of being easily made into little globular forms. More than the half of them are purgative, and the dose is generally 4 to 8 grs. The dose of Pil. Phosphori is only 1 to 2 grs., of Pil. Saponis Co. and of Pil. Plumbi C. Opio 2 to 4 grs., of Pil. Quininæ 2 to 8 grs., and of Pil. Ferri 5 to 15 grs.

PILULA.	INGREDIENTS.	STRENGTH.
Aloes Barbadensis	Barbados aloes, hard soap, oil of caraway, and confection of roses.	1 in 2.
Aloes et Asafet.	Socotrine aloes, asafetida, hard soap, and confection of roses.	1 in 4.
Aloes et Ferri ..	Exsiccated ferrous sulphate, Barbados aloes, compound powder of cinnamon, and syrup of glucose.	2 & 1 in 9.
Aloes et Myrrhæ	Socotrine aloes, myrrh, and syrup of glucose.	2 & 1 in $4\frac{1}{2}$
Aloes Socotrinæ	Socotrine aloes, hard soap, volatile oil of nutmeg, and confection of roses.	1 in 2.
Cambogiæ Co. ..	Gamboge, Barbados aloes, hard soap, compound powder of cinnamon, and syrup of glucose.	1 in 6.
Colocynth. Co. ..	Colocynth, Barbados aloes, scammony resin, potassium sulphate, oil of cloves, and water.	1 in 6.
Colocynth. et Hyoscyami ..	Compound colocynth pill and extract of hyoscyamus.	2 & 1 in 3.
Ferri	Dried ferrous sulphate, dried sodium carbonate, acacia, tragacanth, syrup, glycerin, and distilled water.	1 in 5.
Galbani Co. ..	Asafetida, galbanum, myrrh, and syrup of glucose.	1 in $3\frac{1}{2}$.
Hydrargyri ..	Mercury, confection of roses, and powdered liquorice.	1 in 3.
Hydrarg. Subchlor. Co.	Calomel, sulphurated antimony, guaiacum resin, castor oil, and alcohol (90%).	1 in $4\frac{1}{2}$.
Ipecacuanhæ C. Scilla	Dover's powder, squill, ammoniacum, and syrup of glucose.	1 in 20.
Phosphori	Phosphorus, white beeswax, lard, kaolin, carbon bisulphide, gum acacia.	1 in 50.
Plumbi c. Opio ..	Lead acetate, opium, syrup of glucose.	6 & 1 in 8.
Quininæ Sulphatis	Quinine sulphate, tartaric acid, glycerin, tragacanth.	5 in 6.
Rhei Co.	Rhubarb, socotrine aloes, myrrh, hard soap, oil of peppermint, and syrup of glucose.	1 in $3\frac{2}{3}$.
Saponis Co.	Opium, hard soap, and syrup of glucose.	1 in 5. (of opium.)
Scammonii Co. ..	Resins of scammony and jalap, curd soap, and tincture of ginger.	1 in $3\frac{1}{4}$.
Scillæ Co.	Squill, ginger, ammoniacum, hard soap, and syrup of glucose.	1 in $4\frac{1}{5}$.

Nearly all the pill masses are dark brown or black in colour, only a few can be distinguished by sight—thus Pil. Hydrarg. is *blue;* Hyd. Subchlor. Co. a *bright orange;* and Quininæ Sulph. *white.* The majority are distinguishable by smell—thus, Colocynth is known by its odour of cloves; Barbados aloes by its caraway; Socotrine aloes by its nutmeg; Aloes et Asafetidæ by its powerful fetid odour; whilst in Pil. Galbani Co. the myrrh almost conceals the stinking gum; Pil. Cambogiæ smells

strongly of Barbados aloes, and is not of the yellow colour which the student might expect; Pil. Scillæ Co. is known by the odour of its ammoniacum; Saponis by its tawny colour and opium smell; Rhubarb by its peppermint; and Lead and Opium by the odour of acetic acid.

Pulveres (Powders) are 16 in number—

PULVIS.	INGREDIENTS.	DOSE IN GRAINS.	STRENGTH.
Amygdalæ Co.	Sweet almonds, refined sugar, and acacia gum.	——	8 in 13.
Antimonialis	Antimonious oxide and calcium phosphate.	3 to 6.	1 in 3.
Catechu Co.	Catechu, kino, krameria, cinnamon, and nutmeg.	10 to 40.	1 in 2½.
Cinnamomi Co... ..	Cinnamon, cardamoms, and ginger.	10 to 40.	1 in 3.
Cretæ Aromaticus ..	Cinnamon, nutmeg, cloves, cardamoms, sugar, and chalk.	10 to 60.	1 in 4.
Cretæ Aromat. C. Opio	Aromatic chalk powder, and opium.	10 to 40.	1 in 40. (opium.)
Elaterini Co.	Elaterin and milk sugar.	1 to 4.	1 in 40.
Glycyrrhizæ Co. ..	Senna, liquorice root, sugar, fennel fruit and sulphur.	60 to 120.	1 in 6
Ipecacuanhæ Co. ..	Ipecacuanha, opium, and potassium sulphate.	5 to 15.	1 in 10.
Jalapæ Co.	Jalap, cream of tartar, and ginger.	20 to 60.	1 in 3.
Kino Co...	Kino, opium, and cinnamon.	5 to 20.	1 in 20 (opium.)
Opii Co...	Opium, black pepper, ginger, caraway, and tragacanth.	2 to 10.	1 in 10.
Rhei Co...	Rhubarb, light (or heavy) magnesia, and ginger.	20 to 60.	1 in 4½.
Scammonii Co.	Scammony resin, jalap, and ginger.	10 to 20.	1 in 2.
Sodæ Tart. Efferves.	Tartarated soda 120 grs., sodium bicarbonate 40 grs. in blue paper; tartaric acid 38 grs. in white paper.	198.	120, 40, and 38.
Tragacanthæ Co. ..	Tragacanth, gum acacia, starch, and sugar.	20 to 60.	1 in 6.

The official powders are all called "compound" except 4—Antimonial, Aromatic Chalk, Aromatic Chalk with Opium, and Seidlitz Powder. They can be for the most part distinguished by their colour, which is given with the exact weight of each constituent under the name of the drug, in the "Materia Medica." The student cannot, however, depend upon colour

alone, as cinnamon, aromatic chalk, aromatic chalk with opium, ipecacuanha, jalap, rhubarb, and scammony closely resemble each other, only differing by very faint gradations of colour. The smell, along with the colour, will distinguish most of them—thus, the odour of opium distinguishes the aromatic chalk and opium powder from the plain aromatic chalk.

Spiritus (Spirits—of which there are 18 in number) are for the most part alcoholic solutions of a volatile oil. The student should remember that all are colourless when freshly prepared except brandy.

SPIRITUS.	COMPOSITION.	STRENGTH.	DOSE.
Ætheris	Ether and alcohol (90%).	1 in 3.	20 to 40 m. or 60 to 90 m.
Ætheris Compositus (*Hoffman's Anodyne.*)	Ethereal oil, ether, and alcohol (90%).	S. G. ·808 to ·812	20 to 40 m. or 60 to 90 m.
Ætheris Nitrosi ..	An alcoholic solution containing ethyl nitrite, aldehyde, and other substances.	S. G. ·838 to ·842	20 to 40 m. or 60 to 90 m.
Ammoniæ Aromat.	Carbonate, strong solution of ammonia, oil of nutmeg, oil of lemon, alcohol (90%), and water.	1 in 40. (Carbonate). 1 in 20. (Liq.Am. F.)	20 to 40 m. or 60 to 90 m.
Ammoniæ Fetidus ..	Asafetida, strong solution of ammonia, and alcohol (90%).	1½ in 20.	20 to 40 m. or 60 to 90 m.
Anisi	Oil of anise and alcohol (90%).	1 in 10.	5 to 20 m.
Armoraciæ Compos.	Horseradish root, bitter orange peel, nutmeg, alcohol (90%), and water.	1 in 8.	1 to 2 drs.
Cajuputi	Oil of cajuput and alcohol (90%).	1 in 10.	5 to 20 m.
Camphoræ	Camphor and alcohol (90%).	1 in 10.	5 to 20 m.
Chloroformi	Chloroform and alcohol (90%).	1 in 20.	5 to 20 or 30 to 40 m.
Cinnamomi	Oil of cinnamon and alcohol (90%).	1 in 10.	5 to 20 m.
Juniperi	Oil of juniper and alcohol (90%).	1 in 20.	20 to 60 m.
Lavandulæ	Oil of lavender and alcohol (90%).	1 in 10.	5 to 20 m.
Menthæ Piperitæ ..	Oil of peppermint and alcohol (90%).	1 in 10.	5 to 20 m.
Myristicæ	Oil of nutmeg and alcohol (90%).	1 in 10.	5 to 20 m.
Rectificatus	Alcohol, with 10 per cent. of water.	90%	—
Rosmarini	Oil of rosemary and alcohol (90%).	1 in 10.	—
Vini Gallici	Spirit distilled from wine.	43⅓% ethyl hydrate.	—

Six spirits, it will be noticed, have two ranges of doses given ; the larger is for a single dose, the smaller for repeated administration.

Spiritus Rectificatus is Alcohol (90 per cent.), and from it the diluted alcohols are prepared. (See page 290.) Spirits of juniper and nutmeg are ordered, if not clear, to be shaken with a little powdered talc and filtered.

Succi (Juices—6 in number).—Lemon juice is the *freshly* expressed juice which is used to make the syrup, the remaining five, which are regarded as the juices proper, are prepared by adding 1 measure of alcohol (90 per cent.) to 3 measures of the freshly expressed juice of the recently collected plants.

SUCCUS.	SOURCE.	DOSE.
Belladonnæ	Fresh leaves and young branches.	5 to 15 mins.
Conii	Fresh leaves and young branches.	1 to 2 drs.
Hyoscyami	Fresh leaves, flowering tops, and young branches.	½ to 1 dr.
Limonis	The ripe fruit.	——
Scoparii	Fresh tops.	1 to 2 drs.
Taraxaci	Fresh root.	1 to 2 drs.

Suppositoria (Suppositories—7 in number) are small, solid masses, weighing about 15 grs. and of conical shape, containing some active ingredient blended with a fatty or gelatin basis for introduction into the rectum. The glycerin suppository is made to weigh 30, 60, or 120 grs. each.

SUPPOSITORIA.	INGREDIENTS.	STRENGTH. GRS. IN EACH.
Acidi Carbolici ..	Phenol, white beeswax, and oil of theobroma.	1 gr.
Acidi Tannici	Tannic acid and oil of theobroma.	3 grs.
Belladonnæ	Alcoholic extract of belladonna, glycerin, and oil of theobroma.	1½ gr. each = $\frac{1}{60}$ gr. alkaloids.
Glycerini	Gelatin, glycerin, and water.	70 per cent.
Iodoformi	Iodoform and oil of theobroma.	3 grs.
Morphinæ	Morphine hydrochloride and oil of theobroma.	¼ gr.
Plumbi Co.	Lead acetate, opium, and oil of theobroma.	3 grs. and 1 gr. opium.

Syrupi (Syrups—22 in number) are strong solutions of sugar, each charged with some preparation either to preserve it or make its administration more agreeable. 14 are of vegetable origin. They are mostly—the S.G. being generally about 1·33—$\frac{1}{3}$ heavier than water, and loaf sugar only is used in their preparation, and the water that enters into their composition is to be distilled; the dose averages 1 drachm.

The syrups are recognised by their colour, with which the student should be familiar. Syrup, syrup of orange flowers, chloral, iodide and phosphate of iron, lactophosphate of lime, codeine, and tolu are *colourless*. Syrups of squill, lemon, orange, and ginger and aromatic syrup are straw-coloured; the last 3 being somewhat muddy. Syrups of rhubarb, prune, and hemidesmus are brown, whilst syrup of senna is a dark coffee-brown. Syrups of red poppy and red rose are of brilliant shades of red.

SYRUPS.

SYRUPUS.	INGREDIENTS.	STRENGTH. (by volume)
Syrupus	Sugar, 5 lbs., water q.s. to 7½ lbs.	1 in 1⅛.
Aromaticus	Tincture of orange 5, cinnamon water 5, syrup 10.	—
Aurantii	Syrup and tincture of orange.	1 in 8.
Aurantii Floris	Orange flower water, sugar, and water.	1 in 6¾.
Calcii Lactophosphatis	Calcium carbonate, lactic acid, concentrated phosphoric acid, sugar, orange flower water, water.	—
Cascaræ Aromaticus	Liquid extract of cascara sagrada, tincture of orange, alcohol (90%), cinnamon water, syrup.	in 2½
Chloral	Chloral hydrate, syrup, and water.	1 in 6.
Codeinæ	Codeine phosphate, water, syrup.	1 in 240.
Ferri Iodidi	Iron wire, iodine, sugar and water, 1 gr. in 11 minims.	1 in 11.
Ferri Phosph.	Iron wire, concentrated phosphoric acid, syrup, water.	1 in 60.
Ferri Phosphatis cum Quinina, et Strychnina	Iron wire, concentrated phosphoric acid, strychnine, quinine sulphate, syrup, and water.	1, $\frac{4}{5}$, and $\frac{1}{32}$ gr. in 1 dr
Glucosi	Syrup and liquid glucose.	1 in 3.
Hemidesmi	Hemidesmus root, sugar, and water.	1 in 8.
Limonis	Fresh lemon peel, juice, alcohol (90%), and sugar.	1 in 2.
Pruni Virginianæ	Virginian prune bark, sugar, glycerin, water.	3 in 20
Rhei	Rhubarb root, coriander fruit, sugar, alcohol (90%), and water.	1 in 15.
Rhœados	Fresh red poppy petals, sugar, water, and alcohol (90%).	1 in 3¾.
Rosæ	Dried red rose petals, sugar, and water.	1 in 17.
Scillæ	Vinegar of squill and sugar.	1 in 17. (of squill.)
Sennæ	Senna, oil of coriander, sugar, water, and alcohol (90%).	1 in 2.
Tolutanus	Balsam of tolu, sugar, and water.	1 in 29.
Zingiberis	Ginger, alcohol (90%), and syrup.	1 in 40.

Tabellæ (Tablets—only one preparation is official).

Tabellæ Trinitrini—Tablets of chocolate each weighing 5 grs., and containing $\frac{1}{100}$ gr. of trinitroglycerin of commerce.

Tincturæ (Tinctures—67 in number) are alcoholic solutions, chiefly of vegetable substances, though two are from the animal kingdom—viz., cochineal and Spanish fly. Two are from the inorganic world—viz., perchloride of iron and iodine, the remaining 63 being of vegetable origin.

One pint is the quantity ordered in all the tinctures with two exceptions—viz., Belladonna (30 ozs.) and Nux Vomica (12 ozs.).

The B.P. process of *percolation* for tinctures, as given in an Appendix, is briefly:—Moisten the solids with a small quantity of the menstruum and set aside in a closed vessel for 24 hours. Pack in a percolator, and percolate with the menstruum added gradually until about $\frac{3}{4}$ of the amount of tincture is obtained. Press the marc removed from the percolator, and filter the expressed liquid, mix it with the percolate, and make up to the required product with the menstruum.

In the *maceration* process the solid ingredients are placed in the whole of the menstruum in a closed vessel for 7 days, frequently agitating. Strain, press the marc. Mix the liquids, and filter if necessary.

25 are made by simple maceration.

29 are made by percolation.

13 are made by simple solution or mixing.

Alcohol of various strengths is used in making 65 of the tinctures—Alcohol (90%) in 20, alcohol (70%) in 14, alcohol (60%) in 21, alcohol (45%) in 10, whilst water, in addition, is used in 6 tinctures.

1 with spirit of ether (Ethereal Tincture of Lobelia).

1 with tincture of orange (Tincture of Quinine).

49 tinctures consist of one ingredient and the solvent—"Simple Tinctures."

9 tinctures are called compound—"Compound Tinctures."

9 tinctures, though not *called* compound, contain more than one ingredient and the solvent—"Complex Tinctures."

Tincture of Jalap is made to contain $1\frac{1}{2}$% resin.

7—Belladonna, Compound Camphor, Cinchona, Compound Cinchona, Nux Vomica, Opium, and Ammoniated Opium—have a definite alkaloidal strength, and only 1—Digitalis—has a strength of 1 in 8, and 1—Belladonna—of 1 in 15. Belladonna and Nux Vomica are prepared from their liquid extracts; Camph. Co. and Opii Ammon. from Tinct. Opii; and Cinchona Co. from Tinct. Cinchonæ.

The dosage of 6 tinctures—Aconiti, Aloes, Cantharidis, Opium, Rhei Co., and Sennæ Co.—is given both for a single dose and for repeated administration.

TINCTURA.	INGREDIENTS.	STRENGTH.	DOSE.
Aconiti	Root, alcohol (70%).	1 in 20	5 to 15 or 2 to 5 m.
Arnicæ	Rhizome, „ (70%).	1 in 20	—
Asafetidæ ..	Gum, „ (70%).	1 in 5	½ to 1 dr.
Aurantii	Fresh peel, „ (90%).	1 in 4	½ to 1 dr.
Belladonnæ ..	Liquid extract, „ (60%).	1 in 15 (·048 to ·052% alkaloids)	5 to 15 m.
Buchu..	Leaves, „ (60%).	1 in 5	½ to 1 dr.
Calumbæ	Root, „ (60%).	1 in 10	½ to 1 dr.
Cannab. Ind. ..	Extract, „ (90%).	1 in 20	5 to 15 m.
Cantharidis ..	Flies, „ (90%).	1 in 80	5 to 15 or 2 to 5 m.
Capsici	Fruit, „ (70%).	1 in 20	5 to 15 m.
Cascarillæ ..	Bark, „ (70%).	1 in 5	½ to 1 dr.
Chiratæ	Herb, „ (60%).	1 in 10	½ to 1 dr.
Cimicifugæ ..	Rhizome, „ (60%).	1 in 10	½ to 1 dr.
Cinchonæ ..	Red bark, „ (70%).	1% alkaloids	½ to 1 dr.
Cinnamomi ..	Bark, „ (70%).	1 in 5	½ to 1 dr.
Cocci	Insects, „ (45%).	1 in 10	5 to 15 m.
Colchici Sem. ..	Seeds, „ (45%).	1 in 5	5 to 15 m.
Conii	Fruit, „ (70%).	1 in 5	½ to 1 dr.
Croci	Stigmas, „ (60%).	1 in 20	5 to 15 m.
Cubebæ	Fruit, „ (90%).	1 in 5	½ to 1 dr.
Digitalis	Leaves, „ (60%).	1 in 8	5 to 15 m.
Ferri Perchlor.	Strong liquor, water, and „ (90%).	1 in 4	5 to 15 m.
Gelsemii	Root, „ (60%).	1 in 10	5 to 15 m.
Hamamelidis..	Bark, „ (45%).	1 in 10	½ to 1 dr.
Hydrastis ..	Rhizome, „ (60%).	1 in 10	½ to 1 dr.
Hyoscyami ..	Leaves, „ (45%).	1 in 10	½ to 1 dr.
Jaborandi ..	Leaves, „ (45%).	1 in 5	½ to 1 dr.
Jalapæ	Root, „ (70%).	1·5% resin	½ to 1 dr.
Krameriæ ..	Root, „ (60%).	1 in 5	½ to 1 dr.
Limonis	Fresh peel, „ (90%).	1 in 4	½ to 1 dr.
Lobeliæ Æth. ..	Herb, spirit of ether.	1 in 5	5 to 15 m.
Lupuli	Strobiles, alcohol (60%).	1 in 5	½ to 1 dr.
Myrrhæ	Gum resin, „ (90%).	1 in 5	½ to 1 dr.
Nuc. Vomicæ ..	Liquid extract, water, „ (90%).	·24 to ·26% strychnine	5 to 15 m.
Opii	Opium, water, „ (90%).	·7 to ·8% morphine	5 to 15 and 20 to 30 m.
Podophylli ..	Resin, „ (90%).	2 grs. in 1 dr.	5 to 15 m.
Pruni Virg. ..	Bark, water, „ (90%).	1 in 5	½ to 1 dr.
Pyrethri	Root, „ (70%).	1 in 5	Not taken.
Quassiæ	Chips, „ (45%).	1 in 10	½ to 1 dr.
Quillaiæ	Bark, „ (60%).	1 in 20	½ to 1 dr.
Quininæ	Quinine hydrochlor., tinct. of orange.	1 in 50	½ to 1 dr.
Scillæ..	Bulb, alcohol (60%).	1 in 5	5 to 15 m.
Senegæ	Root, „ (60%).	1 in 5	½ to 1 dr.
Serpentariæ ..	Rhizome, „ (70%).	1 in 5	½ to 1 dr.
Stramonii ..	Leaves, „ (45%).	1 in 5	5 to 15 m.
Strophanthi ..	Seeds, „ (70%).	1 in 40	5 to 15 m.
Sumbul	Root, „ (70%).	1 in 10	½ to 1 dr.
Tolutana	Balsam, „ (90%).	1 in 10	½ to 1 dr.
Zingiberis ..	Rhizome, „ (90%).	1 in 10	½ to 1 dr.

COMPLEX TINCTURES.

TINCTURA.	INGREDIENTS.	STRENGTH.	DOSE.
Aloes	Extract of Barbados aloes, liquid extract of liquorice, alcohol (45%).	1 in 40.	½ to 1 dr. and 1½ to 2 drs.
Catechu	Catechu, cinnamon, alcohol (60%).	1 in 5.	½ to 1 dr.
Ergotæ Ammon.	Ergot, solution of ammonia, alcohol (60%).	1 in 4.	½ to 1 dr.
Guaiaci Ammon.	Resin, oil of nutmeg, oil of lemon, strong solution of ammonia, alcohol (90%).	1 in 5.	½ to 1 dr.
Iodi	Iodine, potassium iodide, water and alcohol (90%).	1 in 40.	2 to 5 mins.
Kino	Gum kino, glycerin, water, and alcohol (90%).	1 in 10.	½ to 1 dr.
Opii Ammon. (Scotch Paregoric.)	Tincture of opium, benzoic acid, oil of anise, strong solution of ammonia, alcohol (90%).	5 grs. opium in 1 oz.	½ to 1 dr.
Quininæ Am.	Quinine sulphate, solution of ammonia, alcohol (60%).	1 in 50.	½ to 1 dr.
Valerianæ Ammon.	Rhizome, oil of nutmeg, oil of lemon, solution of ammonia, and alcohol (60%).	1 in 5.	½ to 1 dr.

COMPOUND TINCTURES.

Benzoini Co. (Friar's Balsam.)	Benzoin, storax, tolu, socotrine aloes, alcohol (90%).	1 in 10.	½ to 1 dr.
Camphoræ Co. (Paregoric.)	Tincture of opium, benzoic acid, camphor, oil of anise, alcohol (60%).	2 grs. opium in 1 oz.	½ to 1 dr.
Cardamomi Co.	Seeds, caraway, raisins, cinnamon, cochineal, alcohol (60%).	1 in 80.	½ to 1 dr.
Chloroformi et Morphinæ Co.	Chloroform, morphine hydrochloride, diluted hydrocyanic acid, tincture of capsicum, tincture of Indian hemp, oil of peppermint, glycerin, alcohol (90%).	¾ min. & $\frac{1}{11}$ gr. in 10 mins.	5 to 15 m.
Cinchonæ Co.	Tincture of cinchona, orange peel, serpentary, saffron, cochineal, alcohol (70%).	·45 to ·55% alkaloids.	½ to 1 dr.
Gentianæ Co.	Root, orange peel, cardamoms, alcohol (45%).	1 in 10.	½ to 1 dr.
Lavandulæ Co.	Oil of lavender, oil of rosemary, cinnamon, nutmeg, red sanders wood, alcohol (90%).	1 in 213.	½ to 1 dr.
Rhei Co.	Root, coriander fruit, cardamoms, glycerin, and alcohol (60%).	1 in 10.	½ to 1 dr. and 2 to 4 drs.
Sennæ Co.	Leaves, raisins, caraway, coriander, and alcohol (45%).	1 in 5.	½ to 1 dr. and 2 to 4 drs.

Trochisci (Lozenges—17 in number) are small tablets, composed of a basis, blended with a medicinal substance. The 4 bases ordered are—Fruit, Rose, Simple, and Tolu, the directions for preparation of each being given at length in an Appendix to the Pharmacopœia. Briefly, *Simple* basis consists of sugar, gum acacia, mucilage of gum acacia, and water. For *Rose* basis, rose water, instead of distilled water, is used; whilst for *Tolu* and *Fruit* basis, tincture of tolu and black currant paste of commerce are used respectively in addition to the other four materials.

TROCHISCUS.	INGREDIENTS.	STRENGTH OF EACH.
Acidi Benzoici ..	Benzoic acid, fruit basis.	$\frac{1}{2}$ gr.
Acidi Carbolici ..	Phenol, tolu basis.	1 gr.
Acidi Tannici ..	Tannin, fruit basis.	$\frac{1}{2}$ gr.
Bismuthi Compositus	Bismuth oxycarbonate, Magnesium carbonate, Precipitated calcium carbonate, Rose basis.	2 grs. 2 grs. 4 grs.
Catechu	Catechu, simple basis.	1 gr.
Eucalypti Gummi	Eucalyptus gum, fruit basis.	1 gr.
Ferri Redacti ..	Reduced iron, simple basis.	1 gr.
Guaiaci Resinæ ..	Guaiacum resin, fruit basis.	3 grs.
Ipecacuanhæ ..	Ipecacuanha, fruit basis.	$\frac{1}{4}$ gr.
Krameriæ	Extract of krameria, fruit basis.	1 gr.
Krameriæ et Cocainæ	Extract of krameria, Cocaine hydrochloride, Fruit basis.	1 gr. $\frac{1}{20}$ gr.
Morphinæ	Morphine hydrochloride, tolu basis.	$\frac{1}{36}$ gr.
Morphinæ & Ipecac	Do. with the addition of ipecacuan.	$\frac{1}{36}$ and $\frac{1}{12}$ gr.
Potassii Chloratis	Potassium chlorate, rose basis.	3 grs.
Santonini..	Santonin, simple basis.	1 gr.
Sodii Bicarbonatis	Sodium bicarbonate, rose basis.	3 grs.
Sulphuris	Precipitated sulphur, cream of tartar, sugar, gum acacia mucilage, and tincture of orange.	5 grs.

Unguenta (Ointments—44 in number) are mixtures of medicinal substances with lard, paraffin, lanoline or wax and oil, of the consistence of butter, for external application; 21

contain lard in some form. White, in preference to yellow soft paraffin, is to be employed in making white ointments. The 10 ointments of mercury require separate notice.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Acidi Borici	Boric acid, paraffin ointment.	1 in 10.
Acidi Carbolici	Phenol, glycerin, paraffin ointment.	1 in 25.
Acidi Salicylici	Salicylic acid, paraffin ointment.	1 in 50.
Aconitinæ	Aconitine, oleic acid, lard.	1 in 50.
Aquæ Rosæ	Rose water, white beeswax, spermaceti, almond oil, oil of rose.	7 in 19.
Atropinæ	Atropine, oleic acid, and lard.	1 in 50.
Belladonnæ	Liquid extract (evaporated) and benzoated lard.	·6% alkaloids
Cantharidis	Cantharides, benzoated lard.	1 in 10.
Capsici	Capsicum fruit, spermaceti, olive oil.	1 in 4½.
Cetacei	Spermaceti, white beeswax, almond oil, and benzoin.	1 in 5.
Chrysarobini	Chrysarobin and benzoated lard.	1 in 25.
Cocainæ	Cocaine, oleic acid, lard.	1 in 25.
Conii	Juice of hemlock, hydrous wool fat.	2 in 1.
Creosoti	Creosote, hard and soft (white) paraffins.	1 in 10.
Eucalypti	Oil of eucalyptus, soft (white) and hard paraffins.	1 in 10.
Gallæ	Galls and benzoated lard.	1 in 5.
Gallæ cum Opio	Gall ointment and opium.	7½%
Glycerini Plumbi Subacetatis	Glycerin of lead subacetate, paraffin ointment.	1 in 6.
Hamamelidis	Liquid extract and hydrous wool fat.	1 in 10.
Iodi	Iodine, potassium iodide, glycerin, lard.	1 in 25.
Iodoformi	Iodoform and paraffin ointment.	1 in 10.
Paraffini	Hard paraffin, soft paraffin (white or yellow).	3 and 7 in 10
Picis Liquidæ	Tar and yellow beeswax.	5 in 7.
Plumbi Acetatis	Lead acetate and paraffin ointment.	1 in 25.
Plumbi Carbonatis	Lead carbonate and paraffin ointment.	1 in 10.
Plumbi Iodidi	Lead iodide and paraffin ointment.	1 in 10.
Potassii Iodidi	Potassium iodide and carbonate, water, and benzoated lard.	1 in 10.
Resinæ	Resin, yellow beeswax, olive oil, and lard.	1 in 3¾.
Staphisagriæ	Stavesacre seeds, yellow beeswax, and benzoated lard.	1 in 5.
Sulphuris	Sublimed sulphur, benzoated lard.	1 in 10.
Sulphuris Iodidi	Sulphur iodide, glycerin, benzoated lard.	1 in 25.
Veratrinæ	Veratrine, oleic acid, lard.	1 in 50.
Zinci	Zinc oxide and benzoated lard.	3 in 20.
Zinci Oleatis	Zinc oleate, prepared with zinc sulphate, hard soap, and water, mixed with soft paraffin.	1 in 2.

OINTMENTS OF MERCURY.

UNGUENTUM.	COMPOSITION.	STRENGTH.
Hydrargyri	Mercury, lard, suet.	1 in 2.
Hydrg. Ammoniati	Ammoniated mercury, paraffin ointment.	1 in 10.
Hydrarg. Comp. ..	Mercury ointment, olive oil, yellow beeswax, camphor.	1 in 5. (of Hg.)
Hydrg. Iodidi Rubri	Red iodide, benzoated lard.	1 in 25.
Hydrg. Nitratis ..	Mercury, nitric acid, lard, olive oil.	1 in 15. (of Hg.)
Hydrg. Nitratis Dil.	Mercuric nitrate ointment, soft paraffin (yellow).	1 in 5.
Hydrg. Oleatis	Mercuric oleate, benzoated lard.	1 in 4.
Hydrg. Oxidi Flavi	Yellow mercuric oxide, soft paraffin (yellow).	1 in 50.
Hydrg. Oxidi Rubri	Red mercuric oxide, paraffin ointment (yellow).	1 in 10.
Hydrg. Subchloridi	Mercurous chloride, benzoated lard.	1 in 10.

Vina (Wines—of which there are 8 in number) are simply tinctures made with sherry or orange wine instead of alcohol.

VINUM.	COMPOSITION.	STRENGTH.	DOSE.
Antimoniale ..	Tartar emetic, boiling water, and sherry.	2 grs. in 1 oz.	10 to 30 m.; 2 to 4 drs. as emetic.
Aurantii	(Used for citrate of iron and quinine wines.)	10 to 12 per cent. [alcohol.]	——
Colchici	Dried corm and sherry.	1 in 5.	10 to 30 m.
Ferri	1 oz. iron wire and 1 pint sherry.	Variable.	1 to 4 drs.
Ferri Citratis	Iron and ammonium citrate, orange wine.	1 gr. in 1 dr.	1 to 4 drs.
Ipecacuanhæ	Liquid extract of ipecacuanha and sherry.	1 in 20.	10 to 30 m. as expectorant; 4 to 6 drs. as emetic.
Quininæ	Quinine hydrochloride and orange wine.	1 gr. to 1 oz.	½ to 1 oz.
Xericum	(A Spanish wine.)	16 per cent. [alcohol.]	——

The following groups of vegetable substances in the B.P. are of considerable importance :—

Alkaloids.—The following are a few of the distinguishing characters of this group of active nitrogenous principles or

organic bases—They all contain nitrogen; they turn red litmus blue; they may be regarded as compound ammonias; they combine with acids to form salts easily soluble as a rule in water, though they themselves are generally insoluble in water. The following are the pure alkaloids of the B.P.:—

Aconitine,	Codeine,
Atropine,	Strychnine,
Caffeine,	Veratrine.
Cocaine,	

The following salts of alkaloids are contained in the B.P.:—

Apomorphine Hydrochloride,	Morphine Tartrate,
Atropine Sulphate,	Morphine Acetate,
Caffeine Citrate,	Morphine Hydrochloride,
Cocaine Hydrochloride,	Physostigmine Sulphate,
Codeine Phosphate,	Quinine Hydrochloride,
Homatropine Hydrobromide	Quinine Acid Hydrochloride,
Hyoscine Hydrobromide,	Quinine Sulphate,
Hyoscyamine Sulphate,	Strychnine Hydrochloride.

Neutral Principles are bodies closely resembling the alkaloids in action and of complicated chemical constitution. They are Chrysarobin, Elaterin, Salicin, Santonin, and Picrotoxin. (Chrysarobin is not a *pure* principle.)

Glucosides.—Some of the above neutral principles under the action of ferments and acids split up into glucose, alcohols, &c.; these are known as Glucosides, as Picrotoxin, Santonin, Salicin, and Tannic Acid or Tannin.

☞ The student should note the terminology of these bodies. The English names of the alkaloids end in *ine*, and the Latin in *ina*, whilst the neutral principles and glucosides end in *in*, and the Latin in *inum*. (Lupulin, Ergotin, and Euonymin do not belong to these groups.)

Gums are complex viscid bodies obtained by exudation from the stems, or stems and branches of plants. They contain arabin, or bassorin, or both. The B.P. representatives are Acacia and Tragacanth. (Eucalyptus and Kino are not true gums.)

Resins are solid, brittle, non-volatile, complex bodies, generally resulting from the oxidation of volatile hydrocarbons; they are insoluble in water and soluble in alkalies and spirit.

The B.P. representatives are Guaiacum, Jalap, Scammony, and Podophyllum.

Burgundy Pitch and common Resin are generally included in the list of resins.

Gum-Resins are exudations containing variable proportions of gums, resins, and volatile oils. They form emulsions when rubbed up with water, the soluble viscid gum forming a solution which keeps the resinous and oily particles in suspension.

The B.P. representatives are Ammoniacum, Asafetida, Galbanum, Gamboge, Myrrh, and Scammony.

Oleo-Resins are complex bodies consisting of various proportions of resins and volatile oils. The following drugs are true Oleo-resins :—Copaiba, Canada Turpentine, and Frankincense.

Balsams are resinous or oleo-resinous bodies containing either benzoic or cinnamic acid or both. Those contained in the B.P. are Peruvian and Tolu Balsams, Benzoin and Prepared Storax.

☞ Neither of the so-called Canada and Copaiba Balsams belong to this group.

Stearoptenes are crystalline oxidised hydrocarbons, or solid volatile oils, as Camphor, Menthol, and Thymol.

OFFICIAL REMEDIES.

ACACIÆ GUMMI (Gum Acacia)—Leguminosæ.

Gum Arabic; an exudation from the stem and branches of Acacia Senegal, and other species, in spheroidal, colourless tears, or in angular, glistening, colourless or yellowish fragments. Consists chiefly of Arabic Acid.

Demulcent. Used to suspend insoluble powders in mixtures.

Gum Acacia enters into compound almond, and tragacanth powders, phosphorus pill, the lozenge bases, and the following:—

Mucilago Acaciæ 4 and 6.

An almost colourless, translucent, viscid liquid; prepared by dissolving 4 ozs. gum acacia, after rinsing with water, in 6 ozs. cold distilled water.

Enters into the lozenge bases, and into Mist. Ol. Ricini.

ACETANILIDUM (Acetanilide) $CH_3CONHC_6H_5$

(Synonym—Phenyl-Acetamide.)

Commonly known as Antifebrin. Colourless, glistening, scaly crystals obtainable by acting on aniline by glacial acetic acid.

Antipyretic and Analgesic. Dose—1 to 3 grains.

Acetum Cantharidis, Acetum Ipecac., and Acetum Scillæ—(See under "Cantharis, Ipecac., Scilla.")

ACIDUM ACETICUM (Acetic Acid) CH_3COOH

A colourless acid liquid, with a pungent odour, prepared from wood by destructive distillation, and by oxidation of ethylic alcohol, and containing 33 per cent. of hydrogen acetate.

Counter-irritant, Vesicant, and Caustic.

The following preparations contain free acetic acid:—

Acetum Cantharidis; Acetum Ipecac.; Acetum Scillæ; Acid. Aceticum; Acid. Aceticum Dilutum; Acid. Aceticum Glaciale; Liniment. Terebinth. Acet.; Oxymel; Oxymel Scillæ; Syrupus Scillæ; Liquor Morphinæ Acetatis.

Acidum Aceticum Dilutum 1 in 8.

A colourless liquid, prepared by mixing acetic acid 2½ ozs. and sufficient distilled water to make one pint. Contains 4·27 per cent. of hydrogen acetate.

Refrigerant and Diuretic. Dose—½ to 2 drs.

In—Acetum Scillæ, Acetum Ipecac., and Liquor Morphinæ Acetatis.

Acidum Aceticum Glaciale (Glacial Acetic Acid).

Concentrated acetic acid—a colourless fluid, crystallising when cooled, and containing 99 per cent. of hydrogen acetate.

Powerfully Caustic.

In—Acetum Cantharidis, Lin. Tereb. Acet., and Liq. Ferri Acet.

The following are the percentages of real acetic acid found in: Acetic Acid, 33·0; Dilute Acetic Acid, 4·27; Glacial Acetic Acid, 99.

ACIDUM ARSENIOSUM (Arsenious Anhydride) As_4O_6.

(Synonyms—Arsenic; White Arsenic; Arsenious Acid.)

An anhydride (not a true acid), occurring as a heavy white powder or in sublimed vitreous masses, obtained by roasting arsenical ores. It is also known as arsenious oxide.

Alterative, Tonic, and Caustic. Dose—$\frac{1}{60}$ to $\frac{1}{15}$ gr.

Liquor Arsenicalis 1 gr. in 110 mins. (Synonyms—Liquor Potassæ Arsenitis; Fowler's Solution).

A pinkish liquid, composed of arsenious anhydride in powder, and potassium carbonate, of each 87½ grs., compound tincture of lavender 5 drs., distilled water to 1 pint.

Dose—2 to 8 mins.

This is the most frequently used preparation of arsenic; and, like all the preparations of the drug, should be commenced in small doses and gradually increased. A good rule is to begin in adults with 2 minims and gradually increase to 8 or more—always after meals, and freely diluted. Children bear as large doses as adults.

Liquor Arsenici Hydrochloricus 1 gr. in 110 mins.

A colourless liquid, prepared by dissolving arsenious anhydride 87½ grs. in hydrochloric acid 2 drs., and distilled water to 1 pint. (This is three times the strength of De Valangin's Solvent.)

Dose—2 to 8 minims freely diluted.

Arsenii Iodidum (Arsenious Iodide) AsI_3

Small orange crystals obtained by direct combination of iodine and arsenium.

Alterative and Tonic. Dose—$\frac{1}{20}$ to $\frac{1}{5}$ gr.

Liquor Arsenii et Hydrargyri Iodidi 1 gr. in 110 mins.

A clear, pale yellow liquid, prepared by dissolving 87½ grs. of arsenious iodide and 87½ grs. of mercuric iodide in distilled water to 1 pint.

Known as Donovan's Solution.

Alterative and Antisyphilitic. Dose—5 to 20 minims.

Ferri Arsenas (Ferrous Arsenate, $Fe_3(AsO_4)_2,6H_2O$, with Ferric Arsenate and some Iron Oxide). (Arseniate of Iron B.P. 85.)

A tasteless, amorphous, greenish powder, insoluble in water, but readily soluble in hydrochloric acid. Prepared by mixing solutions of sodium arsenate and bicarbonate with one of ferrous sulphate, filtering and drying at a low temperature.

Alterative like Arsenic. Dose—$\frac{1}{16}$ to $\frac{1}{4}$ grain, in pill.

Sodii Arsenas Na_2HAsO_4 (Sodium Arsenate.)

(Arseniate of Sodium, hydrous, B.P. 85.)

A soluble white powder obtained by exposing to 300°F. crystallised sodium arsenate which may be prepared by treating with water the product of the fusion of arsenious anhydride, sodium nitrate, and sodium carbonate.

Dose—$\frac{1}{40}$ to $\frac{1}{10}$ grain, in pill or in mixture.

Liquor Sodii Arsenatis 1 gr. in 110 mins.

A colourless solution of *anhydrous* sodium arsenate, 17½ grs. in distilled water to 4 ozs. (Pearson's Solution is 1 in 600).

Dose—2 to 8 minims, diluted, after food.

ACIDUM BENZOICUM (Benzoic Acid) C_6H_5COOH.

A crystalline acid, obtained from benzoin by sublimation. It is also obtained from toluene, from hippuric acid, and from other organic compounds. In light feathery plates and needles, nearly colourless, and odourless when quite pure, but when obtained from benzoin has an aromatic odour.

Antiseptic, Expectorant, and Diuretic. Dose—5 to 15 grs.

In—Benzoates of Sodium and Ammonium, Tr. Camph. Co., and Tr. Opii Ammon.

Trochiscus Acidi Benzoici ½ gr. in each.

Composed of benzoic acid and fruit basis.

ACIDUM BORICUM (Boric Acid) H_3BO_3

(Synonyms—Boracic Acid; Hydrogen Borate). Colourless, pearly, lamellar crystals, obtained by the action of sulphuric acid on borax, or from native boric acid. Dose—5 to 15 grs.

Antiseptic and Diuretic.

Glycerinum Acidi Borici 6 in 16 (by vol.).

Boric Acid 6 ozs. added to 9 ozs. (by weight) glycerin heated to 302°F. When dissolved, maintain at this temperature till it weighs 10 ozs., then add 10 ozs. (by weight) glycerin.

Unguentum Acidi Borici 1 in 10.

A white or faintly yellow ointment, prepared by mixing sifted boric acid 1 oz. with 9 ozs. paraffin ointment (white).

Antiseptic.

ACIDUM CARBOLICUM (Phenol) C_6H_5OH

An acid obtained by the fractional distillation of coal-tar oil. In colourless acicular crystals, which become an oily liquid like creosote, at at least 102°F.

Antiseptic and Escharotic. Dose—1 to 3 grs., in pill.

Commonly called Carbolic Acid. Enters into Injectio Ergotæ Hypoderm. and Liquor Thyroidei.

Acidum Carbolicum Liquefactum (Liquefied Phenol) 90·9 per cent.

A colourless liquid, usually changing to pink, prepared by the addition of 10 per cent. of water to phenol.

Dose—1 to 3 minims, largely diluted.

Glycerini Acidi Carbolici 1 in 5 (1 *in* 6¼ by weight).

A thick, colourless liquid, prepared by dissolving phenol 1 oz. in glycerin to 5 fl. ozs. One fluid drachm contains 12 grs.

Suppositoria Acidi Carbolici 1 gr. in each.

Phenol 12 grs.; white beeswax 24 grs.; oil of theobroma, q.s. Divided into 12 small conical masses.

Antiseptic and Local Anæsthetic.

Trochiscus Acidi Carbolici 1 gr. in each.

Each lozenge contains phenol 1 gr. with tolu basis.

Unguentum Acidi Carbolici 1 in 25.

Phenol ½ oz.; paraffin ointment (white) 10½ ozs.; glycerin 1½ ozs.
Antiseptic and Deodorant.

ACIDUM CHROMICUM (Chromic Anhydride) CrO_3

(Commonly called Chromic Acid).

In crimson acicular crystals, prepared by interaction of potassium bichromate and sulphuric acid.
Caustic.

Liquor Acidi Chromici 1 in 4, or 29½ per cent. real acid, H_2CrO_4

An orange-red, inodorous acid liquid, prepared by dissolving 1 oz. chromic anhydride in 3 ozs. distilled water.
Caustic.

ACIDUM CITRICUM (Citric Acid) $C_3H_4OH(COOH)_3,H_2O$

An acid, in colourless rhombic crystals, obtained from the juice of the fruit of various species of Citrus.

Refrigerant. Dose—5 to 20 grs., in water.

20 grs. dissolved in half an oz. of water, are equivalent to one table-spoonful of fresh lemon juice, and will saturate in an effervescing mixture,

30 grs. bicarbonate of potassium in 1 oz. water.
24 grs. carbonate of potassium in 1 oz. water.
41 grs. carbonate of sodium in 1 oz. water.
24 grs. bicarbonate of sodium in 1 oz. water.
17 grs. carbonate of ammonium in 1 oz. water.

Succus Limonis, Syr. Limonis, Sodii Phosp. Efferves., Sodii Sulph. Efferves., Mag. Sulph. Efferves., Lithii Citras Efferves., contain free citric acid.

ACIDUM GALLICUM (Gallic Acid) $C_6H_2(OH)_3COOH, H_2O$

An acid in yellowish-white, satiny needles, prepared by the action of dilute sulphuric acid on tannic acid. Soluble in 100 parts of cold water.

Astringent. Used in internal hæmorrhages.

Dose—5 to 15 grs. in solution, in pill, or in powder.

Preparations containing gallic or tannic acids should not be combined with any preparation containing iron.

ACIDUM HYDROBROMICUM DILUTUM 1 in 10.

A colourless aqueous solution, containing 10 per cent. of hydrogen bromide, HBr., prepared by distilling potassium bromide with concentrated phosphoric acid.

Hypnotic and Sedative, like KBr. Dose—15 to 60 minims.

ACIDUM HYDROCHLORICUM (Hydrochloric Acid)

Hydrogen chloride gas (HCl), produced by interaction of H_2SO_4 and NaCl, dissolved in water, and forming 31·79 per cent. of the solution, which is nearly colourless and strongly acid, emitting white pungent fumes.

Caustic—not used internally in this form.

In—Acid. Nitro-Hydrochlor. Dil.; Liq. Arsenici Hydrochlor.; Glycerinum Pepsini, and the following :—

Acidum Hydrochloricum Dilutum 1 in 3·3. (10·58 per cent. Hydrogen Chloride.)

A colourless mixture of hydrochloric acid and distilled water.

Dose—5 to 20 minims, in water.

In—Liq. Morph. Hydrochlor. and Inj. Apomorph. Hypoderm. Used in making Ext. Ergotæ.

ACIDUM HYDROCYANICUM DILUTUM 1 in 50.

(Diluted Hydrocyanic Acid) HCN

Hydrogen Cyanide, dissolved in water, and forming 2 per cent. of the solution ; prepared by interaction of potassium ferrocyanide and diluted sulphuric acid. It is a colourless liquid with a peculiar odour. Known as Dilute Prussic Acid.

Should be stored in a dark place, in small inverted stoppered bottles of amber-coloured glass, the stoppers being tied over with impervious tissue.

Sedative—a deadly poison. Dose—2 to 6 minims, in water.

Scheele's Prussic Acid is 2½ times stronger than the above.

In—Tinct. Chlorof. et Morph. Co. 1 in 20, and Aq. Laurocerasi ·1%.

ACIDUM LACTICUM (Lactic Acid) $CH_3CHOHCOOH$

A colourless syrupy liquid, consisting of hydrogen lactate and 25 per cent. of water, prepared by the action of a special ferment on lactose.

A solvent of false membranes. Used in preparing Syr. Calcii Lactophos.

ACIDUM NITRICUM (Nitric Acid) HNO_3

An acid prepared by interaction of potassium nitrate, or sodium nitrate and sulphuric acid, and containing 70 per cent. by weight of real HNO_3. A colourless heavy liquid, emitting an acrid, corrosive vapour.

Corrosive—Not used internally in this form.

In—Liq. Ferri Pernit., Liq. Hydrarg. Nit. Acidus, Ungt. Hyd. Nit., and

Acidum Nitricum Dilutum 1 in $5\frac{1}{6}$.

A colourless mixture of nitric acid 3 ozs. and 7 drs. and distilled water to make 1 pint—corresponding to 17·44 per cent. real acid.

Tonic and Astringent. Dose—5 to 20 minims.

Acidum Nitro-Hydrochloricum Dilutum ¾ and 1 in 8.

Nitric Acid, 3 ozs.; hydrochloric acid, 4 ozs.; distilled water, 25 ozs., making a colourless liquid, which should be kept in a stoppered bottle 14 days before being used. It contains free chlorine, hydrochloric, nitric and nitrous acids.

Dose—5 to 20 minims, freely diluted.

ACIDUM OLEICUM (Oleic Acid or Hydrogen Oleate) $CH_3(CH_2)_7CH{:}CH\ (CH_2)_7COOH$

A straw-coloured liquid, nearly odourless and tasteless, obtained by the saponifying action of alkalies and subsequent action of acids, or by the action of superheated steam, upon the olein of fats. Usually not quite pure.

Used in making Mercuric Oleate and Ointments of Aconitine, Atropine, Cocaine, and Veratrine.

ACIDUM PHOSPHORICUM CONCENTRATUM (Concentrated Phosphoric Acid) 66·3 per cent. H_3PO_4

A colourless syrupy liquid, consisting of hydrogen orthophos-

phate with 33·7 per cent. of water, obtained by treating the product of burning phosphorus in air with water and nitric acid.

Externally, Caustic. Internally, Tonic.

In—Syrups of Calcium Lactophosphate, of Ferrous Phosphate, and of Phosphate of Iron with Quinine and Strychnine; in preparation of Dilute Hydrobromic Acid; and

Acidum Phosphoricum Dilutum 3 in 20. (13·8 per cent. H_3PO_4)

A colourless liquid, prepared by mixing 3 fl. oz. concentrated phosphoric acid with q.s. distilled water to measure 1 pint.

Tonic and Refrigerant. Dose—5 to 20 minims.

ACIDUM SALICYLICUM (Salicylic Acid) $C_6H_4OHCOOH$

An acid in distinct, prismatic, colourless crystals, obtained from natural salicylates, as oils of wintergreen (Gaultheria procumbens) and sweet-birch (Betula lenta), or by the interaction of sodium carbolate and carbonic anhydride.

Antipyretic and Antirheumatic. Dose—5 to 20 grs.

Enters into Injectio Cocainæ Hypodermica and Liq. Atropin. Sulph.

Unguentum Acidi Salicylici 1 in 50.

A white ointment, prepared by mixing 10 grs. salicylic acid, and 490 grs. white paraffin ointment.

Antiseptic.

Sodii Salicylas $(C_6H_4,OH,COONa)_2H_2O$

Small colourless crystalline scales, or in tabular crystals of pearly lustre if prepared from natural acid, obtained by interaction of salicylic acid and sodium carbonate or sodium hydroxide.

Antipyretic and Antirheumatic. Dose—10 to 30 grs. in water.

Used in making Bismuthi Salicylas.

Salicylic Acid or its Sodium Salt should not be prescribed with Quinine in a mixture.

ACIDUM SULPHURICUM (Sulphuric Acid) H_2SO_4

A heavy, colourless liquid, of oily consistence, formed by burning sulphur, and acting on the resulting sulphurous acid by means of nitrous and aqueous vapours. It contains 98 per cent. of real H_2SO_4.

A powerful Corrosive.

Acidum Sulphuricum Aromaticum 1 in 14.

(Synonym—Elixir of Vitriol.)

An aromatic liquid, prepared by mixing 3 fl. ozs. sulphuric acid gradually with 29½ ozs. alcohol (90 per cent.), and adding ½ oz. spirit of cinnamon, and 10 ozs. tincture of ginger. Contains 13·8 per cent. H_2SO_4.

Tonic and Astringent. Dose—5 to 20 minims, freely diluted.

In—Infusum Cinchonæ Acidum.

Acidum Sulphuricum Dilutum 1 in 12 nearly.

A colourless mixture of sulphuric acid 1 oz. $5\frac{1}{4}$ drs. and distilled water q.s. to measure 1 pint. Contains 13·65 per cent. H_2SO_4.

Tonic and Astringent. Dose—5 to 20 minims, freely diluted.

In—Infusum Rosæ Acidum.

ACIDUM SULPHUROSUM (Sulphurous Acid) H_2SO_3

Sulphurous anhydride (SO_2) dissolved in water, forming a colourless liquid, with a pungent sulphurous odour, and constituting 5 per cent. of the solution, equivalent to 6·4 per cent. H_2SO_3. The SO_2 is prepared by burning S, or by boiling H_2SO_4 with carbon, mercury, or copper.

Antiseptic. Externally—Antiparasitic. Dose—$\frac{1}{2}$ to 1 dr.

ACIDUM TANNICUM (Tannic Acid) $C_{14}H_{10}O_9,2H_2O$

(Synonym Tannin).

An acid in pale brownish powder, consisting of thin glistening scales, extracted by water-saturated ether from galls which have been subjected to a special fermentation.

Powerfully Astringent. Readily soluble in water.

Dose—2 to 5 grs. in pill, powder, or solution.

Glycerinum Acidi Tannici 1 in 5. (1 *in* $6\frac{1}{4}$ by weight).

A brownish green viscid liquid, prepared by triturating tannic acid 1 oz. with glycerin to make 5 ozs.

Local Astringent and Styptic.

Suppositoria Acidi Tannici 3 grs. in each.

Tannic acid 3 grs., and oil of theobroma 12 grs.

Local Astringent and Styptic.

Trochiscus Acidi Tannici $\frac{1}{2}$ gr. in each.

Composed of tannic acid with fruit basis.

ACIDUM TARTARICUM (Tartaric Acid) $C_4H_6O_6$

An acid, in colourless crystals, prepared from the acid tartrate of potassium.

Refrigerant. Chiefly used in effervescing mixtures.

Dose—5 to 20 grains in water.

In—Mag. Sulph. Efferves., Sodii Phosph. Efferves., Sodii Sulph. Efferves., Pulv. Sodæ Tart. Efferves., and Lithii Citras Efferves.

ACONITI RADIX (Aconite Root)—Ranunculaceæ.

The dried root of Aconitum Napellus, marked with the scars and bases of broken rootlets. A brownish-black tapering root, collected in autumn from cultivated British plants.

Cardiac Sedative. Active principle—Aconitine.

Linimentum Aconiti 1 in 1½.

A brown liquid prepared by macerating and percolating aconite root 20 ozs. in No. 40 powder with 30 ozs. alcohol (90 per cent.) and adding 1 oz. camphor. Product 30 ozs.

A powerful Sedative and Anodyne. For external use only.

Tinctura Aconiti 1 in 20.

A pale sherry-coloured liquid, prepared by percolating dried aconite root 1 oz. in No. 40 powder with alcohol (70 per cent.) 1 pint.

Dose—5 to 15 mins.; if very frequently repeated, 2 to 5 mins.

Aconitina (Aconitine) $C_{33}H_{45}NO_{12}$

A colourless alkaloid, obtained from aconite root.

A powerful Poison. Should not be given internally.

Unguentum Aconitinæ 1 in 50.

An ointment, composed of aconitine 10 grs.; oleic acid 80 grs.; lard 410 grs.

Similar in action to the liniment.

ADEPS (Lard).

The internal fat of the hog, Sus scrofa, purified by melting and straining.

It enters into the preparation of 20 ointments (either as lard or benzoated lard), into Emplastrum Cantharidis, and Pil. Phosphori.

ADEPS BENZOATUS (Benzoated Lard) 1 to 33⅓.

Made by heating 1 lb. of lard and 210 grs. of benzoin for two hours on a water-bath and straining.

Emollient. Less liable to decompose than Adeps.

Enters into the composition of 12 ointments.

ADEPS LANÆ (Wool Fat).

A yellowish, sticky unctuous, almost odourless, substance, being the purified cholesterin-fat of sheep's wool. Used for the preparation of

Adeps Lanæ Hydrosus (Hydrous Wool Fat)

Commonly known as Lanoline, and prepared by triturating in a warm mortar, 3 ozs. distilled water added gradually to 7 ozs. wool fat.

Emollient. Used as a basis for ointments.

In—Unguentum Conii and Ung. Hamamelidis.

ÆTHER (Ether) $(C_2H_5)_2O$

A colourless, volatile, inflammable liquid, with a strong odour, containing not less than 92 per cent. by vol. of ethyl oxide,

prepared from alcohol by interaction with sulphuric acid. Formerly termed sulphuric ether.

A general diffusible Stimulant, Anæsthetic and Narcotic.

Dose—10 to 30 mins. for repeated administration; 40 to 60 mins. for single dose, in syrup or water.

In—Collodium, Collodium Flexile, Tinct. Lobeliæ Ætherea, and the following :—

Æther Purificatus (Purified Ether).

Ether freed from alcohol and water by the action of chloride of calcium, lime, and redistillation.

Used externally as a Local Anæsthetic.

Spiritus Ætheris 1 in 3.

Ether 10 ozs., alcohol (90 per cent.) 20 ozs. (mixed)—making a colourless liquid.

Dose—20 to 40 minims for repeated use; 60 to 90 minims for single dose.

In—Tinctura Lobeliæ Ætherea.

Spiritus Ætheris Compositus 1 in 8 nearly.

(Synonym—Hoffmann's Anodyne). A colourless liquid, consisting of heavy oil of wine (prepared by the action of 36 ozs. sulphuric acid on 4 ozs. alcohol (90 per cent.), $5\frac{1}{2}$ ozs. of ether, and 38 ozs. alcohol (90 per cent.).

Stimulant and Anodyne. Dose—same as Spt. Ætheris.

Spiritus Ætheris Nitrosi (Spirit of Nitrous Ether).

(Synonym—Sweet Spirit of Nitre). A transparent and almost colourless "alcoholic solution containing ethyl nitrite, aldehyde, and other substances," obtained by cautiously heating together 3 ozs. nitric acid, 2 ozs. sulphuric acid, 2 ozs. copper wire, and 1 pint alcohol (90 per cent.) in a retort, and afterwards adding q.s. alcohol (90 per cent.) to the distillate, so that it may contain $2\frac{1}{2}$ per cent. ethyl nitrite.

Diaphoretic, Diuretic, and Antispasmodic.

Dose—Same as Spt. Ætheris; 8 minims for a child 1 year old.

ÆTHER ACETICUS (Acetic Ether) $CH_3{\cdot}COO(C_2H_5)$.

A colourless liquid, with an agreeable odour, prepared by distilling dried sodium acetate, ethylic alcohol, and sulphuric acid, and purifying by the action of potassium carbonate.

Stimulant. Dose—20 to 40 mins. for repeated administration; 60 to 90 mins. for single dose.

In—Liquor Epispasticus.

ALCOHOL ABSOLUTUM (Absolute Alcohol) C_2H_5HO

A colourless liquid, containing not more than 1 per cent. of water, prepared by extracting water from less strong ethylic

alcohol and subsequent distillation. S.G from ·794 to ·7969.

Used in the preparation of Chloroform, Liq. Sodii Ethylatis, and Liq. Ethyl Nitritis.

ALCOHOLS (90 per cent., 70 per cent., 60 per cent., 45 per cent., and 20 per cent.), see under Spiritus Rectificatus.

ALOE BARBADENSIS (Barbados Aloes)—Liliaceæ

The juice which flows from the transversely cut leaves of Aloe vera, A. chinensis, and probably other species, evaporated to dryness; from the West Indian Islands in masses varying in colour from yellowish or reddish-brown to chocolate-brown or almost black, with a disagreeable odour like the axilla. The powder is a dull greenish yellow. Known as Barbados and Curaçao aloes.

Dose—2 to 5 grns.

ALOE SOCOTRINA (Socotrine Aloes)—Liliaceæ.

The juice which flows from the transversely cut leaves of Aloe Perryi, and probably other species, evaporated to dryness. Imported principally by way of Bombay in *golden* or reddish-brown masses, the small fragments of which are translucent at the edges, with an agreeable strong odour. The powder is a bright yellow or orange-brown colour.

Cathartic—Both varieties are similar in action and dose, and their active principle is Aloin.

ALOINUM (Aloin) $C_{16}H_{16}O_7 3H_2O$

Yellow inodorous tufts of acicular crystals, extracted from Barbados or Socotrine aloes by solvents, and purified by recrystallisation.

Cathartic. Dose—$\frac{1}{2}$ to 2 grs. in pill.

In addition to the preparations bearing the name Aloes, all of which are given in the following pages, the drug enters into

Pil. Cambogiæ Co., 1 in 6.	Pil. Rhei Co., 1 in 6.
Pil. Colocynth. Co., 1 in 3.	Extract. Colocynth. Co., 1 in $2\frac{1}{4}$.
Pil. Colocy. et Hyoscy., 1 in $4\frac{1}{2}$.	Tinct. Benzoini Co., 1 in 60.

Decoctum Aloes Compositum 4 grs. (Ext.) in 1 oz.

A rich, dark-brown liquid, prepared by boiling together for five minutes extract of Barbados aloes $\frac{1}{2}$ oz.; myrrh, saffron, and potassium carbonate, of each $\frac{1}{4}$ oz.; extract of liquorice, 2 ozs.; compound tincture of cardamoms, 15 ozs.; distilled water to 50 ozs. The tincture should be added after cooling.

Dose—$\frac{1}{2}$ to 2 ozs.

Extractum Aloes Barbadensis 4 parts from 5.

A *solid* extract, obtained by dissolving Barbados aloes in boiling water, and evaporating the solution.

Dose—1 to 4 grs. in pill. It is less liable to gripe than the powdered aloes.

Pilula Aloes Barbadensis 1 in 2.

Barbados aloes (in powder), 2 ozs.; hard soap (in powder), 1 oz.; oil of caraway, 1 dr.; confection of roses, 1 oz.

Dose—4 to 8 grs.

Pilula Aloes Socotrinæ 1 in 2.

Socotrine aloes (in powder), 2 ozs.; hard soap (in powder), 1 oz.; oil of nutmeg, 1 dr.; confection of roses, 1 oz.

Dose—4 to 8 grs.

Pilula Aloes et Asafetidæ 1 in 4.

Socotrine aloes, asafetida, hard soap, and confection of roses, of each 1 oz.

Cathartic and Antispasmodic. Dose—4 to 8 grs.

Pilula Aloes et Ferri 1 in 9.

Exsiccated ferrous sulphate, 1 oz.; Barbados aloes, 2 ozs.; compound powder of cinnamon, 3 ozs.; syrup of glucose, 3 ozs.

Cathartic and Emmenagogue. Dose—4 to 8 grs.

Pilula Aloes et Myrrhæ 1 in $2\frac{1}{4}$.

Socotrine aloes, 2 ozs.; myrrh, 1 oz.; syrup of glucose, $1\frac{1}{2}$ ozs. Known as Rufus' Pill.

Cathartic and Emmenagogue. Dose—4 to 8 grs.

Tinctura Aloes 1 of Ext. in 40.

A dark brown liquid, prepared by macerating extract of Barbados aloes $\frac{1}{2}$ oz. in liquid extract of liquorice 3 ozs., and alcohol (45 per cent.) to 1 pint.

Dose—$\frac{1}{2}$ to 1 drachm for repeated use; $1\frac{1}{2}$ to 2 drs. for single dose.

ALUMEN (Alum) $Al_2(SO_4)_3K_2SO_4,24H_2O$

Or $Al_2(SO_4)_3(NH_4)_2SO_4,24H_2O$

Aluminium and potassium sulphate (potassium alum), or aluminium and ammonium sulphate (ammonium alum), produced by the combination of aluminium sulphate with potassium sulphate or with ammonium sulphate, in colourless transparent crystalline masses. Crystals soluble in 10 parts of water.

Astringent In large doses Emetic. Dose—5 to 10 grs.

Alumen Exsiccatum (Exsiccated Alum) $Al_2(SO_4)_3K_2SO_4$

Prepared by heating potassium alum until it loses 45 to 46 per cent. of its weight.

Externally—Styptic.

Glycerinum Aluminis 1 *in* 6 (1 *in* $7\frac{1}{2}$ by weight).

A thick syrupy liquid, prepared by triturating and warming (if necessary) 1 oz. alum with 3 drs. water, and glycerin to 6 ozs., and pouring off the clear liquid from any deposit after settling.

Local Astringent.

AMMONIACUM (Ammoniacum)—Umbelliferæ.

A gum-resin exuded from the flowering and fruiting stem of Dorema Ammoniacum, and probably of other species, in pale brown or yellow tears or masses; the fractured surface has a waxy lustre.

A Stimulating Expectorant. Dose—5 to 15 grs.

Emplastrum Ammoniaci Cum Hydrargyro 12 in 15.

Ammoniacum, 12 ozs.; mercury, 3 ozs.; olive oil, 56 grs.; sulphur, 8 grs.; mixed with the aid of heat.

Resolvent to enlarged glands.

Mistura Ammoniaci $13\frac{1}{2}$ grs. in 1 oz.

Ammoniacum $\frac{1}{4}$ oz. rubbed with $7\frac{1}{2}$ ozs. distilled water, and 4 drs. syrup of tolu, and strained through muslin to form a whitish emulsion, like dirty milk.

Dose—$\frac{1}{2}$ to 1 oz.

Ammoniacum also enters into the composition of Pil. Scillæ Co. and Pil. Ipecac. cum Scilla.

AMMONII BENZOAS (Ammonium Benzoate). $C_6H_5COONH_4$

Colourless laminar crystals, prepared by neutralising solution of ammonia with benzoic acid.

Diuretic. Dose—5 to 15 grs. in water.

Ammonii Bromidum NH_4Br

In colourless crystals, very soluble in water; formed by neutralising hydrobromic acid with ammonia.

Laryngeal Sedative. Useful in Whooping Cough.

Dose—5 to 30 grains. For a child 1 year old, 2 grains.

Ammonii Carbonas $N_3H_{11}C_2O_5$ (NH_4HCO_3 + $NH_4NH_2CO_2$)

A volatile salt, consisting of a variable mixture of ammonium hydrogen carbonate with ammonium carbamate, occurring in translucent crystalline masses, with strong ammoniacal odour, and produced on heating ammonium sulphate or chloride with calcium carbonate.

A Diffusible Stimulant, Expectorant and Emetic.

Dose—3 to 10 grs.; 17 grs. neutralise $\frac{1}{2}$ oz. lemon juice.

Used in preparing—Liq. Ammon. Acet., Liq. Ammon. Cit., Spt. Ammon. Aromat., and Bismuth. Carb.

Ammonii Chloridum NH_4Cl

In colourless, inodorous crystals; very soluble in water; prepared by neutralising hydrochloric acid with ammonia. Known as Sal Ammoniac.

Expectorant and Ciliary Excitant.

Dose—5 to 20 grains.

Used in preparing—Liq. Ammoniæ Fortis.

Ammonii Phosphas $(NH_4)_2HPO_4$

In transparent colourless prisms, obtained by neutralising ammonia with phosphoric acid.

Diuretic. Dose—5 to 20 grs. in water.

Linimentum Ammoniæ 1 in 4.

An emulsion known as "hartshorn and oil," composed of—Solution of ammonia, 1 oz.; almond oil, 1 oz.; and olive oil, 2 ozs.

Rubefacient.

Liquor Ammoniæ Fortis NH_3 15·8 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 32·5 per cent. of the solution, prepared by heating a mixture of ammonium chloride and slaked lime, and passing the resulting ammonia into water.

Vesicant. Should not be used internally.

In—Liniment. Camph. Co., Lin. Hydrarg., Liquor Ammoniæ, Spiritus Ammoniæ Aromaticus, Spt. Am. Fetid., and Tr. Guaiaci Ammon.

Liquor Ammoniæ NH_3 1 in 3. 5·2 grs. NH_3 in 1 dr.

Ammoniacal gas, dissolved in water, and constituting 10 per cent. of the liquid, prepared by mixing 1 pint of strong solution of ammonia with two pints of distilled water.

Stimulant and Rubefacient.

In—Linim. Ammoniæ, Tr. Quininæ Ammon., Tr. Ergotæ Ammon., Tr. Valer. Ammon., and Tr. Opii Ammon.

Liquor Ammonii Acetatis $NH_4C_2H_3O_2$ about 6½ %.

A colourless liquid, prepared by neutralizing 1 oz. ammonium carbonate with acetic acid, and adding water to 1 pint.

Diuretic and Diaphoretic. Dose—2 to 6 drs.

Liquor Ammonii Citratis $(NH_4)_3C_6H_5O_7$ nearly 16 %.

A colourless liquid, prepared by neutralizing 2½ ozs. citric acid with about 1¾ ozs. ammonium carbonate, and adding distilled water to 1 pint.

Diuretic. Dose—2 to 6 drs.

Spiritus Ammoniæ Aromaticus 1 of Carbonate and 2 of Liq. Ammon. Fort. in 40. (Synonyms—Spiritus Ammoniæ Compositus; Spirit of Sal Volatile).

An almost colourless liquid, prepared by distilling 4½ drs. oil of nutmeg, 6½ drs. oil of lemon, 6 pints alcohol (90 per cent.), and 3 pints of water. 7 pints are collected and set aside; 9 ozs. are then collected, and in this quantity are dissolved with a gentle heat 4 ozs. carbonate of ammonia, and 8 ozs. strong solution of ammonia, the solution being then added to the 7 pints of distillate.

Cardiac Stimulant. Dose—20 to 40 mins. for repeated use ; 60 to 90 mins. for single dose, diluted.

Often wrongly prescribed with Syrup of Squill.
IN—Mist. Sennæ Co.

Spiritus Ammoniæ Fetidus 1 of Liq. Am. Fort. in 10.

Prepared by distilling 1½ ozs. asafetida with *q.s.* alcohol (90 per cent.), and adding to the distillate 2 ozs. strong solution of ammonia and alcohol (90 per cent.) to measure 20 ozs.

Stimulant and Antispasmodic. Dose—20 to 40 mins. for repeated use ; 60 to 90 mins. for single dose, diluted.

AMYGDALA AMARA (Bitter Almond)—Rosaceæ.

The ripe seed of Prunus Amygdalus *var.* amara. Has a bitter taste, is broader and shorter than the sweet almond, and its aqueous emulsion has the odour of peach blossom.

Yields, when pressed, Oleum Amygdalæ.

Amygdala Dulcis (Sweet or Jordan Almond)—Rosaceæ.

The ripe seed of Prunus Amygdalus *var.* dulcis ; about one inch in length, narrow, and sharp-pointed, with clear brown seed coat, and a sweet taste.

Nutrient and Demulcent.

Yields, when pressed, Oleum Amygdalæ, and enters into

Pulvis Amygdalæ Compositus 8 in 13.

A coarse, whitish powder, composed of 8 ozs. of *sweet* almonds (with their coats removed by steeping in hot water), 4 ozs. sugar, and 1 oz. powdered gum acacia.

Mistura Amygdalæ 1 in 8.

A white emulsion, made by rubbing 2 ozs. of compound powder of almonds with 16 ozs. of distilled water, and straining through muslin.

Dose—½ to 1 oz.

Chiefly used as a vehicle for other medicines, and as a basis for lotions.

Oleum Amygdalæ (Almond Oil).

The pale yellow, almost inodorous, fixed oil expressed from *bitter* or *sweet* almonds.

Demulcent and Emollient.

Used in the preparation of spermaceti and rose water ointments, in phosphorated oil, and liniment of ammonia.

This harmless oil, which is commonly called almond oil, should not be confounded with the oil *distilled* from the bitter almond, which is known as the oil of bitter almonds, and which is a deadly poison, being four times the strength of dilute hydrocyanic acid. It is not, however, in the Pharmacopœia.

AMYL NITRIS (Amyl Nitrite) $C_5H_{11}NO_2$

An ethereal, yellowish liquid, with a fragrant odour, prepared by the interaction of nitrous acid and amylic alcohol that has

been distilled between 262° and 270°F. It consists chiefly of iso-amyl nitrite, but contains other nitrites.

Acts powerfully on arterial spasm.

Dose for inhalation—The vapour of 2 to 5 minims. It may be swallowed in the form of capsule, in dose of ½ to 1 min.

AMYLUM (Starch)—From Graminaceæ.

Starch procured from the grains of common wheat (Triticum sativum); maize (Zea Mays); and rice (Oryza sativa), in white powder or in columnar masses.

Dietetic and Demulcent. Antidote in poisoning by iodine.

In addition to the following, it enters into compound tragacanth powder.

Glycerinum Amyli 1 *to* 8. 1 *in* 10¼ by weight.

A translucent jelly, prepared by heating 1 oz. starch, 6½ ozs. glycerin, and 1½ ozs. distilled water.

An Emollient Application for External use.

Preparations of iodine should not be ordered with starch.

ANETHI FRUCTUS (Dill Fruit)—Umbelliferæ.

The oval, flat, brown, dried, ripe fruit, ⅙th of an inch long, with an aromatic odour, of Peucedanum graveolens.

Carminative.

Aqua Anethi 1 lb. to 1 gallon.

A colourless liquid, prepared by distilling 1 gallon from 1 lb. dill fruit and 2 gals. water.

Dose—½ to 2 ozs. for adults. A favourite drug in the colic of infants. 1 to 2 drs. for a child 1 year old.

Oleum Anethi

The pale yellow oil, distilled from Dill fruit.

Antispasmodic and Carminative. Dose—½ to 3 minims.

ANISI FRUCTUS (Anise Fruit)—Umbelliferæ.

The dried fruit of Pimpinella Anisum, ⅕th inch long, ovoid, greyish brown, and covered with hairs.

Antispasmodic and Carminative.

Conium fruit is distinguished from Anise by its consisting of single mericarps, which are smooth and grooved.

Aqua Anisi 1 lb. to 1 gallon.

A colourless water obtained by distilling 1 gallon from 2 gallons water and 1 lb. anise fruit.

Carminative and Antispasmodic.

Dose—1 to 2 drs. for a child 1 year old.

Oleum Anisi

The colourless or pale yellow oil distilled from anise fruit, or from the fruit of Star-anise, Illicium verum.

Antispasmodic and Carminative. Dose—½ to 3 minims.

In—Tinct. Camphoræ Co., Tinct. Opii Ammon., and

Spiritus Anisi 1 in 10.

The colourless solution, prepared by mixing 1 oz. oil of anise with alcohol (90 per cent.) q.s. to make 10 ozs.

Carminative and Antispasmodic.

Dose—5 to 20 minims. For a child 1 year old, 3 minims.

ANTHEMIDIS FLORES (Chamomile Flowers)—Compositæ.

The dried expanded flower-heads of Anthemis nobilis, resembling dried daisy heads, from cultivated plants.

An Aromatic Stimulant and Bitter Tonic.

Extractum Anthemidis

A soft extract, prepared by evaporating a decoction of flowers, and adding 15 minims of oil of chamomile for every pound of flowers. ☞ This is the only extract containing oil.

Dose—2 to 8 grs.

Oleum Anthemidis

The pale blue or greenish blue oil, which gradually becomes yellowish brown, distilled from chamomile flowers.

Used in making the extract.

Dose—½ to 3 minims, on sugar or in mucilage.

ANTIMONIUM NIGRUM PURIFICATUM (Antimonious Sulphide) Sb_2S_3

Purified black antimony, in the form of a greyish-black powder, being the native sulphide purified from siliceous matter by fusion, and, if necessary, from arsenic by maceration with solution of ammonia.

Used to make Antim. Sulphuratum.

Antimonii Oxidum Sb_4O_6

A greyish-white powder, prepared by pouring a solution of antimonious chloride into water, and decomposing the oxychloride thus formed with carbonate of sodium.

Diaphoretic and Emetic.

Dose—1 to 2 grs. For a child 1 year old, ⅙ to ¼ gr.

Used in the preparation of Antimon. Tartaratum, and in

Pulvis Antimonialis (Antimonial Powder) 1 in 3.

A substitute for James's powder, consisting of oxide of antimony 1 oz. and calcium phosphate 2 ozs.

Acts like the Oxide, only weaker.

Dose—3 to 6 grs. For a child 1 year old, $\frac{1}{4}$ to $\frac{1}{2}$ gr.

Antimonium Sulphuratum Sb_2S_5,Sb_2O_5,Sb_2S_3,Sb_4O_6 and S.

An orange-red powder, known as sulphurated antimony, prepared by boiling antimonious sulphide with sublimed sulphur and caustic soda, adding diluted sulphuric acid and water to the solution before it cools, collecting, washing, and drying the precipitate.

Alterative, Emetic, and Diaphoretic. Dose—1 to 2 grs.

In—Pilula Hydrargyri Subchloridi Composita—(1 in $4\frac{1}{2}$).

Antimonium Tartaratum $(K(SbO)C_4H_4O_6)_2,H_2O$

(Tartarated Antimony). (Synonyms—Tartar Emetic; Potassio-tartrate of Antimony.) In colourless, transparent crystals, with triangular facets; soluble in water; prepared by setting aside a mixture of antimonious oxide and acid potassium tartrate made into a paste with a little water, until combination has taken place, and purifying by crystallisation.

Emetic, Cardiac Depressant, Expectorant.

Dose—As an Emetic, 1 to 2 grs. (For a child 1 year old, $\frac{1}{6}$ gr.) Diaphoretic, $\frac{1}{24}$ to $\frac{1}{8}$ gr.; as an Expectorant, $\frac{1}{8}$ to $\frac{1}{4}$ gr. Given in solution in water.

Vinum Antimoniale (Antimonial Wine) 2 grs. in 1 oz.

Tartarated antimony, 40 grs., dissolved in boiling water 1 oz. and added to sherry q.s. to 1 pint; making a pale, yellowish-brown liquid.

Dose—10 to 30 minims. As an Emetic, 2 to 4 drs. For a child 1 year old, 3 minims as an Expectorant; and 15 minims as an Emetic.

APOMORPHINÆ HYDROCHLORIDUM

$C_{17}H_{17}NO_2HCl$. (Apomorphine Hydrochloride).

(Hydrochlorate of Apomorphine B.P. 85.) The hydrochloride of an alkaloid, obtained by heating morphine or codeine hydrochloride in sealed tubes with HCl.; in small, greyish-white acicular crystals, turning green on exposure to light and air, and soluble in 50 parts of water.

Powerfully Emetic and Expectorant.

Dose—$\frac{1}{20}$ to $\frac{1}{10}$ gr. hypodermically as an Emetic; $\frac{1}{10}$ to $\frac{1}{4}$ gr. by the mouth as an Expectorant.

Injectio Apomorphinæ Hypodermica 1 gr. in 110 mins.

A recently-prepared solution of 1 gr. apomorphine hydrochloride in a mixture of 1 minim dilute HCl and 110 minims water which has been boiled and cooled. Product, 110 minims.

Dose—5 to 10 minims by subcutaneous injection.

AQUA DESTILLATA (Distilled Water) H_2O

Prepared from potable water.

ARAROBA (Araroba)—Leguminosæ.

(Synonyms—Goa Powder ; Crude Chrysarobin.)

A substance found in cavities in the trunk of Andira Araroba, freed as much as possible from fragments of wood, dried and powdered, having a colour varying from brownish yellow to umber brown.

Used for production of chrysarobin, which is its active principle.

ARGENTI NITRAS (Synonym—Lunar Caustic). $AgNO_3$

In flat, colourless crystals, prepared by the interaction of nitric acid and silver. To make the rods commonly known as " Lunar Caustic," the fused crystals are poured into moulds.

Caustic, Astringent, and Nerve Tonic.

Dose—$\frac{1}{4}$ to $\frac{1}{2}$ gr. (in pill). Sometimes, 1 gr. in stomach affections.

As a strong caustic lotion for wounds, ulcers, &c., 1 dr. to 1 oz. As a lotion for ophthalmia in infants, 8 grs. to 1 oz. As an injection for the urethra, 2 grs. to 1 oz.

All solutions of caustic should be made with distilled water, and should not contain any trace of organic matter. Sometimes, however, the salt is dissolved in Spt. Æther. Nit.

Argenti Nitras Induratus (Toughened Caustic)

In white or greyish-white cylindrical rods or cones, prepared by fusing together 475 grs. silver nitrate and 25 grs. potassium nitrate, and pouring the melted mass into moulds.

Used locally as a powerful Astringent and Caustic.

Argenti Nitras Mitigatus (Mitigated Caustic)

White or greyish-white cylindrical rods or cones, prepared by fusion of 1 oz. silver nitrate and 2 ozs. potassium nitrate.

Caustic.

Argenti Oxidum Ag_2O

The brown powder precipitated, on mixing solutions of silver nitrate and calcium hydroxide.

Tonic and Antispasmodic. Dose—$\frac{1}{2}$ to 2 grs., in pill. Pills containing this salt with organic matter, as extracts, alkaloids, &c., rapidly decompose and sometimes explode.

ARMORACIÆ RADIX (Horseradish Root)—Cruciferæ.

The *fresh* root of Cochlearia Armoracia, from cultivated plants. It has often been unreasonably confounded with aconite. A comparison shows—

Aconite Root	Horseradish Root
To be smaller, distinctly tapering to a point, brown on the exterior, odourless, and leaving a tingling sensation on being chewed.	To be larger, much longer, more uniform in circumference, white or cream coloured externally, with strong odour, after being scraped, and with a characteristic taste.

Diuretic, Stimulant, and Sialagogue.

Spiritus Armoraciæ Compositus 1 in 8.

A colourless liquid, prepared by mixing 5 ozs. each of scraped horseradish root and bitter-orange peel, 55 grs. nutmeg, 1¼ pint alcohol (90 per cent.), and 1½ pint water, and distilling 1 quart.

Stimulant and Diuretic. Dose—1 to 2 drachms.

ARNICÆ RHIZOMA (Arnica Rhizome)—Compositæ.

(Synonym—Arnicæ Radix). The dried rhizome and roots of Arnica montana, from 1 to 2 inches long, and $\frac{1}{6}$ to $\frac{1}{4}$ inch thick; curved, rough, and bearing amplexicaul leaf-scars; beset on under surface with numerous brittle, wiry rootlets, and usually terminated by the hairy remains of the stem and leaves. Its peppery taste and peculiar odour distinguish it from Hydrastis, Senega, Serpentary, and Valerian, which it somewhat resembles.

Active principles—Arnicin and inulin, also an essential oil.

Tinctura Arnicæ 1 oz. to 1 pint.

A brandy-coloured liquid, obtained by percolation of 1 oz. arnica rhizome with alcohol (70 per cent.), to 1 pint.

Chiefly used as a lotion for bruises, 1 oz. to 40 ozs. water, but should be used with caution.

Arsenic (*Vide* Acid. Arseniosum).

ASAFETIDA (Asafetida)—Umbelliferæ.

The fetid gum-resin, in irregular softish masses or tears, of a dull yellow colour, which darken by keeping, obtained by incisions from the root of Ferula fœtida, and probably other species.

Active principle is an ethereal oil.

Stimulant and Antispasmodic. Dose—5 to 15 grs.

In—Pil. Galbani Co.

Pilula Aloes et Asafetida 1 in 4.

Socotrine aloes, asafetida, hard soap, and confection of roses, of each 1 oz., well beaten together.

Cathartic and Antispasmodic. Dose—4 to 8 grs.

Spiritus Ammoniæ Fetidus 33 grs. Asafetida in 1 oz.

A clear, faintly-yellow liquid, prepared by distilling a mixture of asafetida 1½ ozs. and alcohol (90 per cent.) 15 ozs., and adding to the distilled spirit 2 ozs. strong solution of ammonia, with as much alcohol (90 per cent.) as will make the product measure 20 ozs.

Dose—20 to 40 minims for repeated administration ; 60 to 90 mins. for single dose, diluted with water.

Tinctura Asafetidæ 1 in 5. (87½ grs. in 1 oz.)

A bright brown liquid, prepared by macerating 4 ozs. asafetida in alcohol (70 per cent.) to make 1 pint.

Dose—½ to 1 drachm.

ATROPINA (Atropine) $C_{17}H_{23}NO_3$

An alkaloid in colourless crystals, obtained from belladonna leaves or root.

Sedative and Anodyne. Dose—$\frac{1}{200}$ to $\frac{1}{100}$ grain.

Unguentum Atropinæ 1 in 50.

A white ointment, prepared by dissolving atropine 10 grs. in oleic acid 40 grs., and mixing with lard 450 grs.

A Local Anodyne.

Atropinæ Sulphas $(C_{17}H_{23}NO_3)_2H_2SO_4$.

A nearly colourless crystalline powder, obtained by neutralising atropine with dilute sulphuric acid.

Dose and action like atropine ; it is very soluble.

Lamellæ Atropinæ (Discs of Atropine).

Discs of gelatin with some glycerin, each weighing about $\frac{1}{50}$ gr. and containing $\frac{1}{5000}$ gr. atropine sulphate.

Liquor Atropinæ Sulphatis 1 gr. in 110 mins.

A colourless solution of 17½ grs. atropine sulphate and 2 grs. salicylic acid in water, which has been boiled and cooled, to make 4 ozs. Containing no spirit, its introduction into the eye does not cause pain.

Dose—½ to 1 minim.

AURANTII CORTEX RECENS (Fresh Bitter-Orange Peel)—Aurantiaceæ.

AURANTII CORTEX SICCATUS (Dried Bitter-Orange Peel)—Aurantiaceæ.

The fresh and dried outer part of the pericarp of Citrus Aurantium *var.* Bigaradia.

Active principles—Hesperidin and a volatile oil.

An Aromatic Bitter and Flavouring ingredient.

In addition to the preparations bearing its name, it enters into Infus. Gentianæ Co., Spirit. Armoraciæ Co., Tr. Cinchonæ Co., and Tr. Gentianæ Co.

Infusum Aurantii 1 oz. to 1 pint (¼ hour).

Dried bitter-orange peel 1 oz. infused in boiling water 1 pint.

A mild Stomachic Tonic. Dose—½ to 1 oz.

Infusum Aurantii Compositum ½ oz. to 1 pint (¼ hour).

Prepared by infusing in 1 pint boiling water, ½ oz. dried bitter-orange peel, ¼ oz. fresh lemon peel, and 55 grs. cloves.

Dose—½ to 1 oz.

Syrupus Aurantii 1 in 8.

1 oz. tincture of orange and 7 ozs. syrup, mixed.

Dose—½ to 1 dr.

Tinctura Aurantii 5 ozs. to 1 pint.

Prepared by macerating 5 ozs. fresh bitter-orange peel in 1 pint alcohol (90 per cent.).

An agreeable Bitter Tonic. Dose—½ to 1 dr.

In—Conf. Sulphuris, Tinct. Quininæ, Syr. Aurant., Syr. Aromat., Syr. Cascaræ Aromat., Troch. Sulph.

Vinum Aurantii 10 to 12 per cent. of alcohol.

Wine of a golden sherry colour, made by the fermentation of a saccharine solution, to which the fresh peel of the bitter orange has been added.

An agreeable Bitter and Stimulating Tonic. Dose—½ to 2 ozs.

In—Vinum Quininæ and Vinum Ferri Citratis.

Aqua Aurantii Floris (Orange-Flower Water).

The nearly colourless fragrant water distilled from the flowers of the bitter-orange tree, as found in commerce. To be diluted, immediately before use in dispensing, with twice its bulk of water.

In—Mist. Olei Ricini, and Syr. Calcii Lactophos.

Syrupus Aurantii Floris 1 in 6¾.

Prepared by dissolving 3 lbs. of sugar in 16 ozs. of distilled water, and adding 8 ozs. of orange-flower water (undiluted) and making up to 4½ lbs. with recently boiled water.

A sweet, colourless syrup, used for Flavouring.

Dose—½ to 1 dr.

BALSAMUM PERUVIANUM (Balsam of Peru)—Leguminosæ.

A dark viscid, liquid balsam, exuded from the trunk of Myroxylon Pereiræ, after the bark has been beaten and scorched.

Active ingredients—Cinnameine, Cinnamic and Benzoic Acids, and a Volatile Oil.

Expectorant. Externally—a stimulant to ulcers.

Dose—5 to 15 minims, in mucilage or with beaten-up egg.

BALSAMUM TOLUTANUM (Balsam of Tolu) Leguminosæ.

A fragrant, soft, solid balsam, obtained from incisions in the trunk of Myroxylon Toluifera.

Expectorant. Dose—5 to 15 grs., with mucilage or egg.

Active ingredients—Volatile Oil, Cinnamic and Benzoic Acids.

In—Tr. Benzoini Co. and

Syrupus Tolutanus 1 in 29.

A colourless syrup, prepared by boiling 1¼ ozs. balsam of tolu in 1 pint distilled water, filtering, and adding 2 lb. sugar. Product, 3 lbs.

Dose—½ to 1 dr. Chiefly used to sweeten cough mixtures.

Enters into Mist. Ammoniaci.

Tinctura Tolutana 2 ozs. to 1 pint.

A bright, reddish-brown liquid, prepared by dissolving 2 ozs. balsam of tolu in alcohol (90 per cent.) to make 1 pint.

A Stimulating Expectorant. Dose—½ to 1 dr.

In—Tolu basis used in making 2 lozenges.

BELLADONNÆ FOLIA (Belladonna Leaves)—Solanaceæ.

The *fresh* ovate, acute, entire, glabrous leaves and branches of deadly nightshade (Atropa Belladonna), collected when the plant is in flower.

Active principles—Atropine and small percentage of Asparagin.

Narcotic and Mydriatic. A powerful Poison.

May be used as a source of Atropine.

Extractum Belladonnæ Viride

A soft, dark-green extract, with a peculiar heavy odour, prepared from the juice of the fresh young leaves and branches of belladonna which is heated gradually to 130°F., and the green colouring matter separated by a calico filter and laid aside. The strained liquor is heated to 200°F. to coagulate the albumen and again filtered. The filtered liquor is evaporated on a water-bath to the consistence of a syrup, the green colouring (previously separated and passed through a hair sieve) added, and the evaporation continued under 140°F. till the consistence of a soft extract is reached.

Anodyne and Sedative. Dose—¼ to 1 gr., in pill.

Succus Belladonnæ

The brownish juice of the fresh leaves and young branches of belladonna, with the addition of ⅓ its bulk of alcohol (90 per cent.).

Action—Anodyne. Dose—5 to 15 minims. (Given in incontinence of urine and whooping-cough).

BELLADONNÆ RADIX (Belladonna Root)—Solanaceæ.

The branched greyish-brown root, ½ to 1 foot long, of Atropa Belladonna ; collected in autumn and dried.

Active principle—Atropine. Recent investigators state that good belladonna root contains *no* atropine, but merely hyoscyamine, which is changed into atropine after prolonged heating, or by treatment with alkalies, &c. (Binz).

In action resembles the leaves.

Used in preparing Atropine and the following—

Extractum Belladonnæ Liquidum (·75 per cent. alkaloids).

A dark brown liquid, prepared by percolation from belladonna root, and made to contain ¾ gr. alkaloids in 110 mins.

Extractum Belladonnæ Alcoholicum (1 per cent. alkaloids).

A dark semi-solid extract, prepared by evaporating the liquid extract, and adding sugar of milk, so that 15 ozs. of the extract may be obtained from 20 ozs. of liq. extract.

Dose—¼ to 1 gr.

Emplastrum Belladonnæ (·5 per cent. alkaloids).

Prepared by evaporating 4 ozs. liquid extract of belladonna down to 1 oz., and adding 5 ozs. melted resin plaster.

A Local Anodyne.

Linimentum Belladonnæ (·38 per cent. alkaloids.)

A light yellowish-brown coloured liquid, prepared by mixing liq. ext. of belladonna 10 ozs., camphor 1 oz., water 2 ozs., and alcohol (90 per cent.), q.s. to make 20 ozs.

A powerful Anodyne.

Suppositoria Belladonnæ ($\frac{1}{60}$ gr. alkaloids each).

Prepared by rubbing 18 grs. alcoholic extract of belladonna with a little oil of theobroma and adding oil of theobroma q.s. for 12 suppositories of 15 grs. each.

A local Anodyne.

Tinctura Belladonnæ (·048 to ·052 per cent. alkaloids.)

Prepared by mixing 2 ozs. liq. ext. of belladonna with alcohol (60 per cent.) q.s. to make 30 ozs.

Dose—5 to 15 minims. 1 min. for a child 1 year old.

Unguentum Belladonnæ (·6 per cent. alkaloids).

A brownish ointment, made by evaporating 2 ozs. of liquid extract of belladonna to ¼ oz., and mixing with it 2¼ ozs. benzoated lard.

A soothing application to Inflamed Piles.

BENZOINUM (Benzoin)—Styraceæ.

The balsamic resin, in mottled masses or light-brown lumps, made up of tears obtained from Styrax Benzoin, and probably other species. Known as Siam and Sumatra Benzoin.

Active ingredient is benzoic acid.

Diuretic and Expectorant, but seldom used internally.

IN—Adeps Benzoatus, Ungt. Cetacei, and the following :—

Tinctura Benzoini Composita 2 ozs. to 1 pint.

(Synonym—Friar's Balsam).

A dark, reddish-brown liquid, prepared by macerating 2 ozs. benzoin, 1½ ozs. storax, ½ oz. balsam of tolu, and 160 grs. Socotrine aloes in q.s. alcohol (90 per cent.), to make 1 pint.

A Stimulating Expectorant. Used as a protective coating for fresh wounds.

Dose—½ to 1 dr. in emulsion. Water decomposes it.

Benzoic Acid and Preparations (See Acidum Benzoicum).

BENZOL

A colourless volatile liquid, which is a mixture of homologous hydrocarbons obtained from light coal-tar oil. It contains about 70 per cent. benzene (C_6H_6), and 20 to 30 per cent. toluene (C_6H_5,CH_3).

Used in making Liq. Caoutchouc and Charta Sinapis.

BISMUTHI CARBONAS (Bismuth Oxycarbonate) $(Bi_2O_2CO_3)_3H_2O$

A white powder, prepared by the interaction of bismuth nitrate and ammonium carbonate.

Antacid and Gastric Sedative. Dose—5 to 20 grs.

Liquor Bismuthi et Ammonii Citratis About 3 grs. Bi_2O_3 in 1 dr. (Synonym—Liquor Bismuthi.)

A colourless solution, prepared thus—Dissolve 613 grs. bismuth oxynitrate in 1 oz. nitric acid (diluted), add water until liquid becomes opalescent. Add 613 grs. potassium citrate and 175 grs. potassium carbonate dissolved in water; boil, cool, filter, and wash precipitate; dissolve it in solution of ammonia q.s. and make up to 1 pint with water.

Dose—½ to 1 dr., diluted.

Bismuthi Oxidum Bi_2O_3

A slightly brownish-yellow powder, prepared by boiling bismuth oxynitrate with solution of sodium hydroxide.

Action and dose same as Bismuthi Carbonas.

Bismuthi Salicylas (Bismuth Salicylate or Oxysalicylate) C_6H_4,OH,COO,BiO

A white or nearly white amorphous powder, prepared by the interaction of bismuth nitrate and sodium salicylate.

Dose—5 to 20 grs. Gastric Sedative.

Bismuthi Subnitras (Bismuth Oxynitrate) $BiONO_3H_2O$

A heavy, white powder, prepared by the interaction of bismuth nitrate and water.

Action and dose same as Bismuthi Carbonas.

Trochiscus Bismuthi Compositus

Each composed of bismuth oxycarbonate 2 grs., heavy magnesium carbonate 2 grs., precipitated calcium carbonate 4 grs., and rose basis.

BORAX (Borax) $Na_2B_4O_7,10H_2O$ (Sodium Pyroborate).

(Synonym—Biborate of Sodium.)

A native salt, in large, transparent, colourless crystals. Can be also obtained by neutralising native boric acid with sodium carbonate, or by boiling native calcium borate with solution of sodium carbonate.

Antiseptic, Emmenagogue, and Diuretic. Dose—5 to 20 grs.

Used in making Acid. Boric.

Glycerinum Boracis 1 to 6. (1 in $8\frac{1}{2}$ by weight.)

A colourless liquid, prepared by dissolving 1 oz. borax in 6 ozs. glycerin.

Used for its soothing action on diseased mucous surfaces.

Mel Boracis 1 in $9\frac{1}{2}$.

A honey-like mixture of borax 1 oz., glycerin $\frac{1}{2}$ oz., and clarified honey 8 ozs.

Action similar to glycerin of borax.

Bromid. Ammonii, Potassii and Sodii. See under respective headings.

BUCHU FOLIA (Buchu Leaves)—Rutaceæ.

The dried leaves of Barosma betulina. Small, yellowish-green, shining, and smooth leaves, with a powerful minty odour. Marked with pellucid dots (oil glands) at the indentations and apex.

The active ingredient is the volatile oil from the oil glands.

A stimulating Diuretic.

Infusum Buchu 1 oz. to 1 pint ($\frac{1}{4}$ hour).

1 oz. bruised buchu leaves infused in 1 pint boiling water.

Dose—1 to 2 ozs.

Tinctura Buchu 4 ozs. to 1 pint.

A brownish-green liquid, prepared by percolating 4 ozs. buchu leaves with 1 pint alcohol (60 per cent.)

Dose—$\frac{1}{2}$ to 1 dr.

BUTYL-CHLORAL HYDRAS Butyl-Chloral Hydrate. $CH_3,CHCl,CCl_2,CH(OH)_2$ Formerly known as Croton-Chloral Hydrate.

Pearly white crystalline scales, with an odour like hydrate of chloral, produced by the action of chlorine gas on aldehyde, and converted by the addition of water into the crystalline hydrate, or trichlorbutylidene glycol.

Hypnotic and Anodyne to fifth nerve. Dose—5 to 20 grs.

CADINUM OLEUM (Oil of Cade)—Coniferæ.

(Synonym—Juniper Tar Oil). The brownish-black, oily, empyreumatic liquid obtained by the destructive distillation of the woody portions of Juniperus Oxycedrus and other species.

Stimulating application in Scaly Skin Diseases.

CAFFEINA (Caffeine) $C_8H_{10}N_4O_2,H_2O$

(Synonym—Theine).

An alkaloid in colourless, *inodorous* silky crystals, obtained from the dried leaves of Camellia Thea, or the dried seeds of Coffea arabica.

Cardiac Tonic and Diuretic. Dose—1 to 5 grs.

Caffeinæ Citras $C_8H_{10}N_4O_2,H_3C_6H_5O_7$

A white, *inodorous* powder, which is unstable, prepared by dissolving 1 oz. caffeine, and 1 oz. citric acid in 2 ozs. water, and evaporating.

Cardiac Tonic and Diuretic. Dose—2 to 10 grs.

Caffeinæ Citras Effervescens 1 in 25.

A granular effervescent powder, consisting of sodium bicarbonate 51 ozs., tartaric acid 27 ozs., citric acid 18 ozs., sugar 14 ozs., and caffeine citrate 4 ozs., heated and granulated.

Dose—60 to 120 grains.

CAJUPUTI OLEUM (Oil of Cajuput)—Myrtaceæ.

A bluish-green mobile oil, with strong camphoraceous odour, distilled from the leaves of Melaleuca Leucadendron (M. Cajuputi).

Diffusible Stimulant and Antispasmodic.

Dose—$\frac{1}{2}$ to 3 minims.

Spiritus Cajuputi 1 in 10.

Oil of cajuput 1 oz. mixed with alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 minims.

Ol. Cajuputi enters into Linimentum Crotonis.

CALCII CARBONAS PRÆCIPITATUS $CaCO_3$

(Precipitated Calcium Carbonate). (Synonym—Precipitated

chalk). A white micro-crystalline powder, prepared by interaction of sodium carbonate and calcium chloride.

Antacid and mildly Astringent. Dose—10 to 60 grs.

In—Trochiscus Bismuthi Co., 4 grs. in each.

Calcii Chloridum (Calcium Chloride) $CaCl_2 2H_2O$

In dry, white, very deliquescent masses, prepared by neutralising hydrochloric acid with calcium carbonate carefully desiccated at a temperature not exceeding 392°F.

Alterative in Scrofula and Phthisis. Dose—5 to 15 grs.

☞ Should not be confounded with the so-called chloride of lime.

Calcii Hypophosphis (Calcium Hypophosphite) $Ca(PH_2O_2)_2$

A white, pearly, crystalline salt, prepared by interaction of phosphorus, calcium hydroxide and water.

Nervine Tonic. Dose—3 to 10 grs.

Calcii Phosphas (Calcium Phosphate) $Ca_3(PO_4)_2$

A light white amorphous powder, insoluble in water, prepared by dissolving bone ash in diluted hydrochloric acid and adding diluted solution of ammonia, washing and drying the precipitate at a temperature not exceeding 212°F., or by the interaction of calcium chloride and sodium phosphate.

Nervine Tonic. Dose—5 to 15 grs.

In—Pulv. Antimonialis and Ext. Euonymi Sic.

Syrupus Calcii Lactophosphatis (Syrup of Calcium Lactophosphate)

Prepared by dissolving precipitated calcium carbonate 2½ ozs. in lactic acid 6 ozs., diluted with water 24 ozs., adding concentrated phosphoric acid 4 ozs. and 262 mins., triturating until the precipitate formed is dissolved, adding a little water, filtering, and adding orange-flower water, undiluted, 2½ ozs., and dissolving, without heat, in the filtrate, sugar 70 ozs., and adding water to make 5 pints.

Dose—½ to 1 dr. Action similar to phosphate.

CALX (Lime) CaO

Calcium oxide in compact whitish masses, obtained by calcining chalk, limestone, or marble.

Caustic. Not used internally.

Calcii Hydras (Calcium Hydroxide) $Ca(HO)_2$

(Synonym—Slaked Lime).

A white powder, recently prepared by the interaction of water and calcium oxide. It acts like Calx.

Used in the preparation of Liq. Ext. of Ipecacuanha, Chloroform, &c.

Liquor Calcis (Solution of Lime) ½ gr. in 1 oz.

(Synonym—Lime Water). Prepared by washing slaked lime 2 ozs., adding water 1 gallon, and syphoning off the clear colourless liquid.

Antacid and Astringent.

Dose—1 to 4 ozs., in milk ; ½ to 1 dr. for a child 1 year old.

Used in the preparation of Argenti Oxid., Liniment. Calcis, Lotio Hydrarg. Flava, Lotio Hydrarg. Nigra.

Liquor Calcis Saccharatus 8 grs. in 1 oz.

(Saccharated Solution of Lime.) Prepared by adding calcium hydroxide 1 oz., and sugar 2 ozs., to water 1 pint, mixing and syphoning.

Same as Liquor Calcis in action. Dose—20 to 60 minims.

Linimentum Calcis 1 in 2.

Lime water and olive oil, of each 2 ozs. (mixed), forming a thick, whitish emulsion, known as Carron oil.

Sedative application to burns and scalds.

☞ The original Carron oil was made with Linseed oil.

Calx Chlorinata

(Chlorinated Lime) A dull white powder, obtained by exposing slaked lime to the action of chlorine gas until absorption ceases. It is known as bleaching powder. It has bleaching and disinfecting properties, and is astringent.

Used in the preparation of Chloroform.

Liquor Calcis Chlorinatæ 1 lb. to 1 gal.

A colourless filtered solution of chlorinated lime in water.

Antiseptic. Yields, when fresh, 3 per cent. Cl.

Chiefly used as a Deodoriser.

Calx Sulphurata (Sulphurated Lime)

A greyish-white, foul-smelling powder, containing not less than 50 per cent. of calcium sulphide (CaS) with calcium sulphate and carbon, prepared by reducing native calcium sulphate by carbon.

Antisuppurative. Dose—¼ to 1 grain in pill.

CALUMBÆ RADIX (Calumba Root)—Menispermaceæ.

The dried transversely cut root (in round or oval irregular flat yellow slices, depressed towards the centre) of Jateorhiza Columba.

Active principles—Calumbine and Berberine.

A Bitter Tonic. Dose—5 to 20 grs. in powder.

Infusum Calumbæ 1 in 20 (½ hour).

1 oz. calumba root macerated in 1 pint of *cold* water.

Dose—½ to 1 oz.

Liquor Calumbæ Concentratus (Concentrated Solution of Calumba) 1 in 2.

It is prepared thus:—Macerate 10 ozs. calumba root for 24 hours in 10 ozs. water, press and again macerate for 24 hours in 10 ozs. water; press and mix the expressed liquids and heat for 5 minutes to 180°F. When cold add 4½ ozs. alcohol (90 per cent.) Decant or filter after standing. Product, 1 pint.

Dose—½ to 1 dr.

Tinctura Calumbæ 1 in 10.

A greenish-brown liquid, prepared by macerating 2 ozs. calumba root in 1 pint alcohol (60 per cent).

Dose—½ to 1 dr.

As calumba root and its preparations do not contain any tannin, they can, like quassia, be prescribed with all the preparations of iron. Cold water is used in making the infusion, lest any of the starch should be extracted.

CAMBOGIA (Gamboge)—Guttiferæ.

A gum-resin in reddish-yellow cylindrical pieces, obtained from Garcinia Hanburii.

Active ingredient—Cambogic Acid.

A Hydragogue Drastic Cathartic. Dose—½ to 2 grs., in pill.

Pilula Cambogiæ Composita 1 in 6.

Composed of gamboge, Barbados aloes, compound cinnamon powder, of each 1 oz.; hard soap, 2 ozs.; syrup of glucose, 1 oz.

Hydragogue Cathartic. Dose—4 to 8 grs.

CAMPHORA (Camphor)—Lauraceæ.

A stearoptene or volatile oil, in translucent, white, crystalline masses, obtained from Cinnamomum Camphora, purified by sublimation.

Stimulant and Antispasmodic. Dose—2 to 5 grs.

In addition to the preparations bearing the name, camphor enters into Ungt. Hydrarg. Co., and into 11 of the 15 liniments of the Pharmacopœia.

Aqua Camphoræ ½ gr. in 1 oz.

Prepared by dissolving 70 grs. camphor in alcohol (90 per cent.) q.s. to make ½ oz., and adding gradually to 1 gallon water.

Only a vehicle for more active remedies.

Linimentum Camphoræ 1 in 5 nearly.

(Synonym—Camphorated Oil.)

A yellow, oily liquid, prepared by dissolving 1 oz. camphor in 4 ozs. olive oil.

A Stimulating Application in chronic painful affections.

In—Lin. Chlorof., Lin. Hydrarg., and Lin. Tereb. Acet.

Linimentum Camphoræ Ammoniatum 1 in 8.

(Synonym—Compound Liniment of Camphor).

A faintly-yellowish liquid, prepared by dissolving 2½ ozs.

camphor and 1 dr. oil of lavender in 12 ozs. alcohol (90 per cent.), and adding 5 ozs. strong solution of ammonia and sufficient alcohol (90 per cent.) to make 1 pint.

A safe and effectual Rubefacient and Counter-irritant.

In absence of other remedies, it may be used as a general diffusible stimulant in 20 minim doses, largely diluted.

Spiritus Camphoræ 1 in 10.

Prepared by dissolving 1 oz. camphor in alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 minims in emulsion.

Tinctura Camphoræ Composita $1\frac{1}{2}$ grs. camphor and the equivalent of 2 grs. opium in 1 oz.

(Synonyms—Paregoric ; Paregoric Elixir).

A sherry-coloured liquid, prepared by dissolving 585 minims tincture of opium, 40 grs. benzoic acid, 30 grs. camphor, and 30 minims oil of anise, in alcohol (60 per cent.) to make 1 pint.

Narcotic and Expectorant. Dose—$\frac{1}{2}$ to 1 dr.

CANNABIS INDICA (Indian Hemp)—Cannabinaceæ.

The dried flowering or fruiting tops of the female plant of Cannabis sativa, from which the resin has not been removed, grown in India ; in elongated compressed bundles of a dusky-green colour, in which may be recognised the flowers, young branches, smaller leaves, and the well-known fruits commonly called hemp seeds. (Known in India as Gunjah or Ganga).

Active principle—Cannabin.

Anodyne and Narcotic.

Extractum Cannabis Indicæ

A rich green resinous extract, prepared from the tops by percolation with alcohol (90 per cent.), and evaporating the tincture thus formed.

Anodyne and Narcotic, like Opium. Dose—$\frac{1}{4}$ to 1 grain.

Tinctura Cannabis Indicæ 1 in 20.

A deep-green liquid, prepared by dissolving 1 oz. of the extract in alcohol (90 per cent.) q.s. to one pint.

Dose—5 to 15 minims, in mucilage or wine.

In—Tr. Chlorof. et Morphinæ Co.

CANTHARIS (Cantharides)—Coleoptera.

The dried beetle Cantharis vesicatoria, about $\frac{3}{4}$ to 1 inch long, with bright metallic green wing covers ; the powder is greyish-brown, with shining green particles.

Active principle—Cantharidin.

Vesicant, Counter-irritant, and Diuretic.

Acetum Cantharidis 1 in 10.

A dark-brown coloured liquid, prepared from 2 ozs. cantharides by percolation with equal parts water and glacial acetic acid, to produce 1 pint.

Epispastic. Not used internally.

Emplastrum Cantharidis 1 in 3 nearly.

A brownish substance, of the consistence of firm ointment, with dark-green shining particles, prepared by heating $3\frac{1}{2}$ ozs. cantharides (in powder), 2 ozs. each yellow beeswax, resin, and lard, and $\frac{1}{2}$ oz. soap plaster. Known as blistering plaster.

Vesicant. Generally blisters in from 6 to 9 hours.

Emplastrum Calefaciens 1 in 24. (Warming plaster).

Prepared by adding to a strong infusion of 4 ozs. of cantharides, 4 ozs. each yellow beeswax and resin, $3\frac{1}{4}$ lbs. resin plaster, and 2 lbs. soap plaster previously heated, mixing and making a firm plaster of a yellow colour.

A stimulating application, and known also as Warm Plaster.

Tinctura Cantharidis 1 in 80.

A pale straw-coloured liquid, prepared by macerating $\frac{1}{4}$ oz. cantharides in 1 pint alcohol (90 per cent.)

Diuretic and Stimulant to the genito-urinary organs.

Dose—5 to 15 minims ; if frequently repeated 2 to 5 minims.

Unguentum Cantharidis 1 to 10.

An ointment of a yellowish-brown colour, prepared by digesting at 120°F. for 12 hours 1 oz. cantharides in 10 ozs. benzoated lard and straining.

Rubefacient. Milder than Emplastrum Cantharidis.

Collodium Vesicans (Blistering Collodion).

A thick liquid, prepared by adding $\frac{1}{2}$ oz. pyroxylin to 20 ozs. blistering liquid.

Vesicant, like Emplastrum and the following :—

Liquor Epispasticus (Blistering Liquid) 1 in 2.

A bright greenish-brown, ethereal liquid, prepared by percolating 10 ozs. cantharides with acetic ether to make 1 pint.

CAOUTCHOUC (India-Rubber)—Euphorbiaceæ.

Elastic masses, of varying thickness, being the prepared milk juice of Hevea brasiliensis and probably other species. Known in commerce as pure Para rubber.

Liquor Caoutchouc 1 in 20.

A thickish liquid, made by dissolving India-rubber 1 oz. in a mixture of 10 ozs. each benzol and carbon bisulphide.

Used in making Charta Sinapis.

CAPSICI FRUCTUS (Capsicum)—Solanaceæ.

A small oblong orange pod, containing flat white seeds, the fruit of Capsicum minimum, known as Cayenne pepper.

Active principle—Capsicin.

A powerful Stimulant and Rubefacient, without blistering.

Dose—½ to 1 gr. 30 grs. in Delirium Tremens.

Tinctura Capsici 1 in 20.

A brandy-coloured liquid, prepared by macerating 1 oz. capsicum fruit in 1 pint alcohol (70 per cent.).

Dose—5 to 15 minims diluted.

In Tr. Chlorof. et Morphinæ Co.

Unguentum Capsici 1 to 4 nearly.

A reddish-coloured ointment, made by warming on a water-bath for 1 hour 120 grs. capsicum fruit with 60 grs. spermaceti and 1 oz. olive oil, and straining.

Rubefacient. Known as Chili paste.

CARBO LIGNI (Wood Charcoal).

A black powder free from grittiness, prepared by exposing wood to a red heat without access of air.

Deodoriser and Absorbent in fetid eructations.

Dose—60 to 120 grs. ; or, sprinkled over foul sores.

CARBONIS BISULPHIDUM (Carbon Bisulphide) CS_2

(Synonym—Carbon Disulphide). A colourless, highly refractive, stinking liquid, prepared by combining carbon and sulphur at a high temperature, condensing and purifying.

Used in preparing Liquor Caoutchouc and Pil. Phosphori.

CARDAMOMI SEMINA (Cardamoms)—Zingiberaceæ.

The small, dried, ripe angular brown seeds of Elettaria Cardamomum, kept in their triangular pericarps till required.

Carminative and Antispasmodic. Dose—5 to 20 grs.

Tinctura Cardamomi Composita 1 in 80.

A deep red liquid, prepared by macerating ¼ oz. each cardamom seeds and caraway fruit, 2 ozs. raisins, ½ oz. cinnamon, 55 grs. cochineal, in 1 pint alcohol (60 per cent.).

Carminative, and colouring agent. Dose—½ to 1 dr.

In addition to the Tincture, cardamom seeds enter into the following :—Ext. Col. Co., Pulv. Cinnam. Co., Pulv. Cretæ Arom., Tr. Gent. Co., Tr. Rhei Co. ; and the Tincture itself enters into Dec. Aloes Co., and Mist. Sennæ Co.

CARUI FRUCTUS (Caraway Fruit)—Umbelliferæ.

The minute brown aromatic seed-like dried fruits of Carum Carvi tapering at each end, and marked with five ridges.

Carminative, Stimulant, and Antispasmodic.

In Confect. Piperis, Pulv. Opii Co., Tr. Card. Co., and Tr. Sennæ Co.

Aqua Carui 1 lb. to 1 gallon.

A colourless water, prepared by distilling 1 gallon of water from 1 lb. of caraway fruit, and 2 gallons of water.

Oleum Carui

The faint-yellow oil distilled from caraway fruit.

Dose—½ to 3 minims, on sugar.

IN—Pilula Aloes Barb.

CARYOPHYLLUM (Cloves)—Myrtaceæ.

The dried unexpanded fragrant flower buds of Eugenia caryophyllata, with a cylindrical body, spherical head, and four teeth.

Carminative, Stimulating Aromatic, and Tonic.

IN—Infus. Aurant. Co. and Pulv. Cretæ Ar.

Infusum Caryophylli 1 in 40 (¼ hour.)

Prepared by infusing ½ oz. cloves in 1 pint boiling water.

Dose—½ to 1 oz.

Oleum Caryophylli

The clear colourless or yellowish oil distilled from cloves.

Antispasmodic, Stimulant, and powerfully Antiseptic.

Dose—½ to 3 minims, on sugar.

IN—Pil. Col. Co., and Pil. Col. et Hyos.

CASCARA SAGRADA (Cascara Sagrada) Rhamnaceæ.

(Synonyms—Rhamni Purshiani Cortex ; Sacred Bark).

The nearly smooth, dark purplish-brown, quilled, channelled or nearly flat, transversely marked dried bark of Rhamnus purshianus. It is usually more or less covered with silvery-grey lichen.

Cathartic and Stimulant to the entire intestinal glandular apparatus. The remedy for *habitual* constipation.

Extractum Cascaræ Sagradæ (Synonym — Extractum Rhamni Purshiani).

A dry extract, prepared by exhausting cascara sagrada by percolating with water, and evaporating the resulting liquid to dryness.

Dose—2 to 8 grs., in pill.

Extractum Cascaræ Sagradæ Liquidum 1 in 1.

(Synonym—Extractum Rhamni Purshiani Liquidum.) An almost black liquid, prepared by exhausting 20 ozs. of cascara sagrada by percolation with distilled water, evaporating the percolate to 12 ozs., and adding 4 ozs. alcohol (90 per cent.) and water q.s. to 1 pint.

Cathartic, Tonic, and Cholagogue. Dose—½ to 1 dr.

Syrupus Cascaræ Aromaticus 1 in 2½.

Made by mixing 8 ozs. liquid extract of cascara sagrada, 2 ozs. tincture of orange, 1 oz. alcohol (90 per cent.), 3 ozs. cinnamon water, and 6 ozs. syrup.

Stomachic Tonic and Laxative. Dose—½ to 2 drs.

CASCARILLA (Cascarilla)—Euphorbiaceæ.

The dried bark of Croton Eluteria in small, dull-brown quills (coated with lichens) covered with a brown separable corky layer, with a warm taste and aromatic odour.

Active principle—Cascarillin.

An Aromatic Bitter Tonic.

Infusum Cascarillæ 1 in 20 (¼ hour).

Prepared by infusing 1 oz. cascarilla in 1 pint boiling water.

Dose—½ to 1 oz.

Tinctura Cascarillæ 1 in 5.

A dark brown liquid, prepared by percolating 4 ozs. of powdered cascarilla with 1 pint alcohol (70 per cent.)

Dose—½ to 1 dr. diluted.

CASSIÆ PULPA (Cassia Pulp)—Leguminosæ.

The soft, sweet, nearly black pulp obtained from the pods of Cassia Fistula. Pods are 1½ to 2 feet long.

Laxative. Used as an addition to senna in Confectio Sennæ.

CATECHU (Catechu)—Cinchonaceæ. (Synonym—Catechu Pallidum.)

An extract of the leaves and young shoots of Uncaria Gambier in variably sized masses, or hard cubes (1 inch each side), brown externally, yellow internally.

Active principles—Catechu-tannic Acid and Catechu.

A Tonic Astringent. Dose—5 to 15 grs., in powder.

Pulvis Catechu Compositus 1 in 2½.

A reddish-brown powder, consisting of catechu, 4 ozs. : kino and krameria root, of each 2 ozs. ; cinnamon and nutmeg, of each 1 oz.

A Tonic Astringent in chronic diarrhœa.

Dose—10 to 40 grs. ; for a child 1 year old, 2 to 5 grs.

Tinctura Catechu 1 in 5.

A rich coffee-brown liquid, prepared by macerating 4 ozs. of catechu and 1 oz. cinnamon in 1 pint alcohol (60 per cent.)

Dose—½ to 1 dr. 5 to 10 minims for a child 1 year old.

Trochiscus Catechu 1 gr. in each lozenge.

Brownish lozenges, consisting of catechu, with simple basis.

Local Astringent for relaxed throat.

CERA ALBA (White Beeswax).

Yellow beeswax bleached by exposure to moisture, air, and light ; in nearly white translucent masses or cakes.

In—Pil. Phosphori, Suppositoria Ac. Carbolici, Ungt. Cetacei, and Ungt. Aq. Rosæ.

CERA FLAVA (Yellow Beeswax)—Hymenoptera.

Prepared from the honey-comb of the Hive Bee, Apis mellifica, in firm, yellow masses ; not unctuous to the touch, melts at 144·5° to 147°F.

Used chiefly as a basis for ointments and plasters.

It enters into 4 ointments and 4 plasters.

CERII OXALAS (Cerium Oxalate) $Ce_2(C_2O_4)_3,9H_2O$

A white granular powder, obtained by the interaction of a soluble cerium salt and a soluble oxalate. It usually contains lanthanum and didymium oxalates.

A Gastric Sedative like bismuth ; given in the vomiting of pregnancy. Dose—2 to 10 grs. in a pill, or as a powder.

CETACEUM (Spermaceti).

A concrete fatty substance, in pearly, lustrous masses, obtained, mixed with oil, from the head of the Sperm whale (Physeter macrocephalus), and separated from oil by filtration and pressure, and afterwards purified.

Internally, Demulcent ; externally, Emollient.

In—Ungt. Capsici, and Ungt. Aq. Rosæ.

Unguentum Cetacei 1 in 5.

A pearly-white ointment, prepared by heating for 2 hours 20 ozs. spermaceti, 8 ozs. white beeswax, 72 ozs. almond oil, and 2 ozs. benzoin, straining and stirring till cold.

An Emollient dressing for sores and blisters.

CHIRATA (Chiretta)—Gentianaceæ.

The dried plant, Swertia Chirata, collected when in flower. The unbranched root is 3 inches, and the stems are 3 feet long, about the size of goose quills, with opposite branches and panicled flowers.

Active principles—Ophelic Acid and Chiratin.

A pure bitter Tonic like gentian.

Infusum Chiratæ 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing 1 oz. chiretta in 1 pint boiling water.

Dose—$\frac{1}{2}$ to 1 oz.

Liquor Chiratæ Concentratus (Concentrated Solution of Chiretta) 1 in 2.

Made by percolating 10 ozs. powdered chiretta with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

Tinctura Chiratæ 1 in 10.

A tea-coloured liquid, prepared by percolating 2 ozs. chiretta with alcohol (60 per cent.) to 1 pint.

Dose—½ to 1 dr.

CHLORAL HYDRAS (Chloral Hydrate) $CCl_3CH(OH)_2$

(Trichlorethylidene glycol). In colourless crystals, obtained by adding water to liquid chloral produced by the action of dry chlorine gas on ethylic alcohol.

Hypnotic and Sedative. Dose—5 to 20 grs.

Syrupus Chloral 10 grs. in 1 dr.

A colourless syrup, prepared by dissolving 1,600 grs. chloral hydrate in 30 drs. water, and adding syrup to 1 pint.

Dose—½ to 2 drs.

CHLOROFORMUM (Chloroform) $CHCl_3$

(Trichloromethane). A limpid, colourless liquid, prepared by heating ethylic alcohol, water, slaked lime, and chlorinated lime. Sufficient absolute alcohol is added to give S.G. 1·490 to 1·495.

Sedative, Anæsthetic, Anodyne, either swallowed or inhaled.

Dose—1 to 5 minims. Externally, Rubefacient or Anodyne.

Aqua Chloroformi 1 in 400.

A colourless solution of 30 minims chloroform in 25 ozs. of water.

Used chiefly as a vehicle. Dose—½ to 2 ozs.

Linimentum Chloroformi 1 in 2.

A pale-yellow liquid, prepared by mixing 2 ozs. each chloroform and liniment of camphor.

Rubefacient and Anodyne.

Spiritus Chloroformi (Spirit of Chloroform) 1 in 20.

(Synonyms—Chloric Ether ; Spirit of Chloric Ether).

1 oz. chloroform dissolved in alcohol (90 per cent.) to make 1 pint.

Dose—5 to 20 minims for repeated administration ; single dose 30 to 40 minims, in water.

Tinctura Chloroformi et Morphinæ Composita 1 in $13\frac{1}{3}$.

Contains ¾ min. of chloroform, $\frac{1}{11}$ gr. morphine hydrochloride, and ½ minim diluted hydrocyanic acid in 10 minims. Introduced as a substitute for Chlorodyne, which it somewhat resembles. It consists of $1\frac{1}{2}$ ozs. chloroform, $87\frac{1}{2}$ grs. morphine hydrochloride, 1 oz. diluted hydrocyanic acid, ½ oz. tincture of capsicum, 2 ozs. tincture of Indian hemp, 14 minims oil of peppermint, 5 ozs. glycerin, and alcohol (90 per cent.) q.s. to make 1 pint.

Narcotic and Antispasmodic. Dose—5 to 15 minims.

CHRYSAROBINUM (Chrysarobin)

A crystalline yellow powder, obtained from Araroba by extracting with hot chloroform, evaporating to dryness and powdering. Consists chiefly of a definite chemical substance also known as chrysarobin, but contains a varying proportion of chrysophanic acid.

Antiparasitic in Skin Diseases.

Unguentum Chrysarobini 1 in 25.

A yellowish ointment, prepared by dissolving with heat 20 grs. chrysarobin in 480 grs. benzoated lard.

Antiparasitic and Stimulating application in psoriasis.

CIMICIFUGÆ RHIZOMA (Cimicifuga)—Ranunculaceæ.

(Synonym—Actææ Racemosæ Radix). The dried brownish-black, flattened cylindrical rhizome, and small, wiry, brittle branched rootlets of Cimicifuga racemosa.

Cardiac Tonic, Expectorant, and Antirheumatic.

Extractum Cimicifugæ Liquidum 1 in 1.

(Synonym—Liquid Extract of Actæa Racemosa).

Prepared by exhausting by percolation 20 ozs. cimicifuga with alcohol (90 per cent.), and dissolving in the first 15 ozs. of percolate the extract obtained by evaporating the remainder, and making up to 1 pint with alcohol (90 per cent.).

Dose—5 to 30 minims.

Tinctura Cimicifugæ 1 in 10.

(Synonym—Tincture of Actæa Racemosa).

Prepared by percolating 2 ozs. cimicifuga (in No. 40 powder) with alcohol (60 per cent.) to make 1 pint.

Dose—½ to 1 dr.

CINCHONÆ RUBRÆ CORTEX (Red Cinchona Bark)—Cinchonaceæ.

The dried bark of the stem and branches of *cultivated* plants of Cinchona succirubra, in quills or incurved pieces, coated with periderm; bark itself $\frac{1}{10}$ to $\frac{1}{4}$ inch thick, outer surface roughened by fissures, cracks, and warts, and brownish-red, inner surface brick red. It should yield between 5 and 6 per cent. of total alkaloids, of which not less than half should consist of quinine and cinchonidine.

Active principles—Quinine, Cinchonine, Cinchonidine, Quinidine, Quinovina (a bitter extract), and Quino-tannic Acid.

Antiperiodic, Tonic, Antipyretic, and Astringent.

Extractum Cinchonæ Liquidum 5 per cent. alkaloids.

A brownish liquid, prepared by exhausting 20 ozs. red cinchona bark with hydrochloric acid, glycerin, and water, and evaporating

to 1 pint, determining the alkaloidal strength of this and by evaporating further, or adding water and alcohol (90 per cent.), making the finished liquid contain 5 grs. of alkaloids in every 110 minims. 1 oz. will nearly represent 1 oz. bark.

Dose—5 to 15 minims.

Infusum Cinchonæ Acidum 1 in 20 (1 hour).

Prepared by infusing for one hour 1 oz. red bark (in No. 40 powder) and 2 drs. aromatic sulphuric acid in 1 pint boiling water.

Dose—½ to 1 oz.

Tinctura Cinchonæ 1 per cent. alkaloids.

A reddish-brown liquid, prepared by percolating 4 ozs. red bark (in No. 40 powder) with alcohol (70 per cent.) so that it will contain 1 per cent. alkaloids.

Dose—½ to 1 dr.

Tinctura Cinchonæ Composita 1 of tinct. in 2 = ½ per cent. alkaloids.

A reddish liquid, prepared by macerating 1 oz. dried bitter orange peel, ½ oz. serpentary rhizome, 55 grs. saffron, and 28 grs. cochineal in 10 ozs. alcohol (70 per cent.), and adding resulting tincture to 10 ozs. tincture of cinchona.

Tonic and Astringent. Dose—½ to 1 dr.

CINNAMOMI CORTEX (Cinnamon Bark)—Lauraceæ.

In light, yellowish-brown, closely-rolled, very thin, splintery quills, being the dried inner bark of shoots from the truncated stocks of cultivated Cinnamomum zeylanicum from Ceylon, and known as Ceylon Cinnamon.

Carminative and Stomachic.

Aqua Cinnamomi 1 in 10.

A colourless water, prepared by distilling 1 gallon from 1 lb. cinnamon bark and 2 gallons water.

Dose—1 to 2 ozs.

In—Mist. Cretæ, Mist. Guaiaci, Mist. Ol. Ricini, Mist. Spt. Vini Gallici, Syr. Aromat., and Syr. Cascaræ Aromat.

Oleum Cinnamomi

The oil distilled from cinnamon bark ; yellowish when recent, but gradually becoming reddish. *It sinks in water.*

Dose—½ to 3 minims, on sugar or in mucilage.

Spiritus Cinnamomi 1 in 10.

1 oz. oil of cinnamon and alcohol (90 per cent.) to make 10 ozs.

Dose—5 to 20 mins.

In—Acid. Sulphuric. Aromat.

Pulvis Cinnamomi Compositus 1 in 3.

(Synonym—Pulvis Aromaticus). A pale brown powder, consisting of cinnamon, cardamoms, and ginger—of each 1 oz.

Dose—10 to 40 grs.

In—Pil. Aloes et Ferri and Pil. Cambogiæ Co.

Tinctura Cinnamomi 1 in 5.

A reddish-brown liquid, prepared by percolating 4 ozs. of cinnamon with alcohol (70 per cent.) to 1 pint.

Dose—½ to 1 dr. ; for a child 1 year old 5 minims, on sugar.

Cinnamon also enters into Decoct. Hæmatoxyli, 3 compound powders—*i.e.*, catechu, kino, chalk, and 3 tinctures—*i.e.*, cardamoms, catechu, and lavender.

COCÆ FOLIA (Coca Leaves)—Erythroxylaceæ.

The smooth, dried, green, oval leaves of Erythroxylum Coca and its varieties, shortly stalked, and with faint tea-like odour. A line is almost always visible on either side of the midrib on the under surface of the leaf. Active principles—Cocaine and Hygrine.

Tonic and Restorative.

Extractum Cocæ Liquidum 1 in 1.

A brown liquid, prepared by exhausting 20 ozs. coca leaves with alcohol (60 per cent.), and proceeding as for Ext. Cimicif. Liq. to produce 1 pint.

Dose—½ to 1 dr.

Cocainæ (Cocaine) $C_{17}H_{21}NO_4$

An alkaloid in colourless prisms, insoluble in water, soluble in alcohol, ether, chloroform, and olive oil, obtained from Erythroxylum Coca and its varieties.

Local Anæsthetic.

Unguentum Cocainæ 1 in 25.

A faintly yellow ointment, prepared by dissolving 20 grs. cocaine in 80 grs. oleic acid, and mixing with lard 400 grs.

Cocainæ Hydrochloridum (Cocaine Hydrochloride)—Hydrochlorate of Cocaine, B.P., 1885. $C_{17}H_{21}NO_4,HCl$

The hydrochloride of an alkaloid in colourless acicular crystals, obtained from Erythroxylum Coca and its varieties.

Local Anæsthetic. Dose—$\frac{1}{6}$ to ½ gr.

Injectio Cocainæ Hypodermica (Hypodermic Injection of Cocaine) 10 grs. in 110 mins.

Made by dissolving 33 grs. cocaine hydrochloride in a solution of ½ gr. salicylic acid in 6 drs. boiling distilled water which has been allowed to cool.

Dose—By subcutaneous injection 2 to 5 minims.

Lamellæ Cocainæ (Discs of Cocaine).

Discs of gelatin with some glycerin, each weighing about $\frac{1}{30}$ gr., and containing $\frac{1}{50}$ gr. of cocaine hydrochloride.

Trochiscus Krameriæ et Cocainæ 1 gr. and $\frac{1}{20}$ gr. in each.

(Synonym—Rhatany and Cocaine Lozenge.) Made to contain extract of krameria 1 gr. and cocaine hydrochloride $\frac{1}{20}$ gr. with fruit basis.

Astringent and Anæsthetic.

COCCUS (Cochineal)—Hemiptera.

The wrinkled, oval, dried fecundated female insect, Coccus Cacti, reared on Nopalea coccinellifera and other species of Nopalea. Used as a rich, red, harmless, colouring agent.

IN—Tr. Card. Co., Tr. Cinch. Co., and

Tinctura Cocci 1 in 10.

A carmine-coloured liquid, prepared by macerating 2 ozs. powdered cochineal in 1 pint alcohol (45 per cent.) Used for colouring mixtures.

Dose—5 to 15 minims.

CODEINA (Codeine) $C_{17}H_{18}(CH_3)NO_3,H_2O$

An alkaloid in colourless trimetric crystals, obtained from opium or morphine.

Hypnotic—given in Diabetes. Dose—$\frac{1}{4}$ to 2 grs.

Codeinæ Phosphas (Codeine Phosphate).

$(C_{17}H_{18}(CH_3)NO_3,H_3PO_4)_2 3H_2O$

The phosphate of an alkaloid in white crystals, very soluble in water, obtained from opium or morphine.

Hypnotic. Dose—$\frac{1}{4}$ to 2 grs.

Syrupus Codeinæ (Syrup of Codeine) 1 in 240. $\frac{1}{4}$ gr. in 1 dr.

A colourless syrup obtained by dissolving 40 grs. codeine phosphate in $\frac{1}{4}$ oz. water and mixing with $19\frac{3}{4}$ ozs. syrup.

Dose—$\frac{1}{2}$ to 2 drs.

COLCHICI CORMUS (Colchicum Corm)—Melanthaceæ.

The *fresh* corm (about the size of a chestnut) of Colchicum autumnale—meadow saffron, and the same stripped of its coats, in thin, white, *dried*, kidney-shaped slices. Collected in early summer.

Active principles—Colchicine and traces of Veratrine.

Diuretic and Purgative—used in Gout. Dose—2 to 5 grs.

Extractum Colchici

A soft, brownish-black extract, prepared by heating the juice of the *fresh* corm to 212°, straining, and evaporating under 160°.

Dose—$\frac{1}{4}$ to 1 gr., in pill.

Vinum Colchici 1 in 5.

A slightly muddy, tea-coloured liquid, prepared by macerating 4 ozs. *dried* colchicum corm in 1 pint sherry.

Dose—10 to 30 minims.

COLCHICI SEMINA (Colchicum Seeds)—Melanthaceæ.

The small, hard, globular reddish-brown dried ripe seeds of Colchicum autumnale.

Active principles—Colchicine and traces of Veratrine.

Action like the corm.

Tinctura Colchici Seminum 1 in 5.

A brown, sherry-coloured liquid, prepared by percolating 4 ozs. colchicum seeds with alcohol (45 per cent.) to make 1 pint.

Dose—5 to 15 minims.

COLLODIUM (Collodion) 1 in 48.

A colourless syrupy liquid, consisting of a solution of 1 oz. pyroxylin in 36 ozs. ether and 12 ozs. alcohol (90 per cent.).

Protective to wounds.

Collodium Flexile (Flexible Collodion)

A colourless, syrupy liquid, prepared by mixing ½ oz. Canada turpentine, ¼ oz. castor oil, and 12 ozs. collodion.

Acts like collodion, but less liable to crack on drying.

Collodium Vesicans (Blistering Collodion).

A thick liquid, consisting of ½ oz. pyroxylin and 20 ozs. blistering liquid.

Acts like cantharides plaster.

COLOCYNTHIDIS PULPA (Colocynth Pulp)—Cucurbitaceæ.

The peeled, dried, spongy, light pulp of the fruit of Citrullus Colocynthis—the bitter apple—in broken white balls, the seeds (resembling apple pips) being rejected.

Active principle—Colocynthin (a glucoside).

A Drastic Cathartic.

Extractum Colocynthidis Compositum 1 in 4½ (nearly).

A firm, blackish mass, prepared by exhausting 6 ozs. colocynth pulp with 1 gallon alcohol (60 per cent.), and, after the volatile alcohol is distilled from the resulting tincture, 12 ozs. extract of Barbados aloes, 4 ozs. resin of scammony, 4 ozs. curd soap, and 1 oz. cardamoms in fine powder, are added, and the evaporation continued till a pilular consistence is reached.

Purgative, like Pil. Col. Co. Dose—2 to 8 grs.

Pilula Colocynthidis Composita 1 in 6.

Prepared by beating together 1 oz. colocynth pulp, 2 ozs. each Barbados aloes and scammony resin, ¼ oz. potassium sulphate, and 2 drs. oil of cloves, with q.s. distilled water. Distinguished from the extract by the odour of cloves.

Dose—4 to 8 grs.

Pilula Colocynthidis et Hyoscyami 1 and 3 in 9.

1 oz. extract of hyoscyamus and 2 ozs. comp. colocynth pill.

Dose—4 to 8 grs. Not so liable to gripe as Pil. Col. Co.

CONII FOLIA (Conium Leaves)—Umbelliferæ.

The finely-divided, smooth, *fresh* leaves and young branches of the Spotted Hemlock, Conium maculatum. Gathered when the fruit begins to form. The stems are smooth and marked with purple spots.

Active principles—Conine, Methyl-conine, and Conydrine.

Anodyne, Narcotic, Sedative.

Succus Conii

A brownish liquid, consisting of the juice of conium leaves and young branches to which ⅓ of alcohol (90 per cent.) is added.

Dose—1 to 2 drs.

Unguentum Conii 2 of juice in 1.

A yellow ointment, prepared by evaporating 2 ozs. conium juice under 140°F. to ⅛ its bulk, and mixing with ¾ oz. hydrous wool fat.

Local Anodyne in painful conditions of the rectum and anus.

This is the ointment first introduced by the writer, and now sanctioned by the B.P.

CONII FRUCTUS (Conium Fruit)—Umbelliferæ.

The dried, full grown, unripe, small, seed-like, greyish fruits, consisting of separate mericarps, with five waved ridges, of Conium maculatum.

Active principles—as from leaves.

Action like the leaves.

Tinctura Conii 1 in 5.

A brownish liquid, prepared by percolating 4 ozs. of the recently comminuted fruit with alcohol (70 per cent.) to 1 pint.

Dose—½ to 1 dr.

COPAIBA (Copaiba) from Leguminosæ.

(Synonym—Copaiva.)

The thick, yellow, fluid oleo-resin, obtained from the trunk of Copaifera Lansdorfii and other Copaifera.

Stimulant to urinary and other mucous surfaces.

Active ingredients—Ethereal Oil and Resin.

Dose—½ to 1 dr., in emulsion, capsules, or confection.

Oleum Copaibæ

The colourless or pale-yellow oil distilled from Copaiba.

Dose—5 to 20 minims, as above.

CORIANDRI FRUCTUS (Coriander Fruit)—Umbelliferæ.

The small, globular, ribbed, yellowish-brown, dried, ripe, seed-like fruit of Coriandrum sativum.

Antispasmodic and Carminative.

IN—Confect. Sennæ, Syr. Rhei, Tinct. Rhei Co., and Tinct. Sennæ Co.

Oleum Coriandri

The yellowish oil distilled from the fruit.

Dose—½ to 3 minims, on sugar or in emulsion.

IN—Syrupus Sennæ.

CREOSOTUM (Creosote).

A colourless or pale-yellow oily liquid, a product of the distillation of Wood Tar. It consists of a mixture of guaiacol, creosol, and other phenols.

Sedative, Astringent, and Antiseptic. Externally, Styptic.

Dose—1 to 5 minims, in pill or in capsules.

Mistura Creosoti 1 minim in 1 oz.

A nearly colourless mixture, consisting of creosote and spirit of juniper, of each 16 mins., syrup 1 oz., and distilled water 15 ozs.

Dose—½ to 1 oz.

Unguentum Creosoti 1 in 10.

A white ointment, prepared by melting together 1 oz. creosote, 4 ozs. hard paraffin, and 5 ozs. white soft paraffin, and stirring till cold.

CRETA PRÆPARATA (Prepared Chalk) $CaCO_3$

Native calcium carbonate in white friable masses or white powder, freed from its impurities by elutriation.

Antacid and Astringent. Dose—10 to 60 grs.

IN—Hydrarg. cum Creta 2 in 3, and in

Mistura Cretæ 1 in 32.

A white, milky mixture, prepared by rubbing up ¼ oz. prepared chalk, 15 grs. tragacanth, and ½ oz. sugar in cinnamon water, q.s. to make 8 ozs.

Dose—½ to 1 oz. For a child 1 year old, 1 to 2 drs.

Pulvis Cretæ Aromaticus 1 in 4 (nearly).

A pale brown powder, consisting of cinnamon 4 ozs., nutmeg 3 ozs., cloves 1½ ozs., cardamoms 1 oz., sugar 25 ozs., chalk 11 ozs.

Astringent. Dose—10 to 60 grs.

Pulvis Cretæ Aromaticus cum Opio 1 in 40 of opium.

A pale brown powder, prepared by mixing 9¾ ozs. of aromatic powder of chalk with ¼ oz. powdered opium.

Aromatic, Astringent, and Narcotic.

Dose—10 to 40 grs.; for a child 1 year old, 1 gr.

CROCUS (Saffron)—Iridaceæ.

The dried stigmas and tops of the styles of Crocus sativus, each terminating in three stigmas, and measuring about 1 inch.

Supposed Emmenagogue; only used for its colour.

In—Decoct. Aloes Co. and Tinct. Cinch. Co.

Tinctura Croci 1 in 20.

A bright yellowish-brown liquid, prepared by macerating 1 oz. saffron in 1 pint alcohol (60 per cent.)

Dose—5 to 15 mins.

CROTONIS OLEUM (Croton Oil)—from Euphorbiaceæ.

The viscid, brownish-yellow oil, *expressed* from the seeds of Croton Tiglium.

Active principle—Crotonolic Acid.

Hydragogue Cathartic, acts generally within one or two hours.

Dose—½ to 1 minim, in pill or on dry sugar.

Linimentum Crotonis 1 in 8.

A green liquid, consisting of croton oil 1 oz., oil of cajuput and alcohol (90 per cent.), of each 3½ ozs.

Rubefacient and Counter-irritant.

CUBEBÆ FRUCTUS (Cubebs)—Piperaceæ.

The globular, dried, full-grown, unripe fruit of Piper Cubeba, about the size and colour of black pepper, with a stalk attached to it; hence called tailed pepper.

Active ingredients—Ethereal Oil and Cubebin.

Diuretic and Expectorant.

Dose in gonorrhœa—30 to 60 grs.

Oleum Cubebæ

A pale greenish-yellow or colourless oil, distilled from cubebs.

Dose—5 to 20 minims, in emulsion with mucilage.

Tinctura Cubebæ 1 in 5.

Prepared by percolating 4 ozs. cubebs with alcohol (90 per cent.) to make 1 pint.

Dose—½ to 1 dr.

CUPRI SULPHAS (Copper Sulphate) $CuSO_4,5H_2O$

(Synonym—Cupric Sulphate).

A blue crystalline salt in triclinic prisms, obtained by interaction of water, sulphuric acid, and copper or cupric oxide.

Astringent, Tonic, Emetic, and Caustic.

Dose—As an Astringent, $\frac{1}{4}$ gr. to 2 grs., in pill ; as an Emetic, 5 to 10 grs., in solution in water.

CUSPARIÆ CORTEX (Cusparia Bark)—Rutaceæ.

The straight incurved pieces or quills, bevelled at the edges, with an external corky layer and mottled brown epidermis of Cusparia febrifuga. Known also as Angostura Bark.

Active ingredients—Cusparine and Volatile Oil.

Bitter Tonic.

Infusum Cuspariæ 1 in 20 ($\frac{1}{4}$ hour).

1 oz. cusparia bark infused in 1 pint boiling water.

Dose—1 to 2 ozs.

Liquor Cuspariæ Concentratus 1 in 2.

Prepared by percolating 1 pint of concentrated solution from 10 ozs. cusparia bark and 25 ozs. alcohol (20 per cent.)

Dose—$\frac{1}{2}$ to 1 dr.

CUSSO (Kousso)—Rosaceæ.

The dried panicles of the pistillate flowers of Brayera anthelmintica in compressed clusters or cylindrical rolls ; the flowers are reddish-brown on hairy stalks, with calyx five-parted.

Active principle—Kosin.

Anthelmintic for *tænia solium*. Dose—$\frac{1}{4}$ to $\frac{1}{2}$ oz.

DIGITALIS FOLIA (Digitalis Leaves)—Scrophulariaceæ.

The large, wrinkled, downy, dried leaves, with bluntly serrated edges of Digitalis purpurea (Purple Foxglove). Collected from plants commencing to flower.

Active principles — Digitalin, Digitalein, Digitoxin, and Digitonin.

Diuretic and Cardiac Tonic. Dose—$\frac{1}{2}$ to 2 grs. in powder.

Infusum Digitalis 60 grs. to 1 pint ($\frac{1}{4}$ hour)

60 grs. digitalis leaf infused in 1 pint boiling distilled water.

Dose—2 to 4 drs.

Tinctura Digitalis 1 in 8.

A dark-brown liquid, prepared by percolating $2\frac{1}{2}$ ozs. digitalis leaf with alcohol (60 per cent.) q.s. to 1 pint.

Dose—5 to 15 mins. (2 to 4 drs. in Delirium Tremens).

ELATERIUM (Elaterium)—from Cucurbitaceæ.

A sediment in thin, friable, greenish-grey, curved cakes, obtained from the juice of the fruit of Ecballium Elaterium.

Hydragogue Cathartic. Dose—$\frac{1}{10}$ to $\frac{1}{2}$ gr.

ELATERINUM (Elaterin) $C_{20}H_{28}O_5$

A chemically neutral substance, being the active principle of elaterium, in small, hexagonal tables.

A Drastic Hydragogue Cathartic. Dose—$\frac{1}{40}$ to $\frac{1}{10}$ gr.

Pulvis Elaterini Compositus 1 in 40.

A white powder, consisting of elaterin 5 grs., rubbed up with milk sugar 195 grs.

Dose—1 to 4 grs., in pill or powder.

ERGOTA (Ergot)—Fungi and Graminaceæ.

Ergot is the spawn or sclerotium of Claviceps purpurea, originating in the ovary of Secale cereale; in long, dark, violet-black, cylindrical, brittle grains, pinkish-white internally.

Active ingredients—Cornutine, Sclerotinic and Sphacelinic Acids.

Emmenagogue. Acts on unstriped muscular fibre.

Dose—20 to 60 grs. Seldom, however, given in powder.

Extractum Ergotæ (Extract of Ergot)

(Synonym—Ergotin).

A soft extract, prepared by exhausting, by percolation, ergot with alcohol (60 per cent.). Water is added to the evaporated product, and, when cold, filtered. Diluted hydrochloric acid is added to the filtrate, and it is again filtered and treated with sodium carbonate, and evaporated to a soft extract.

Dose—2 to 8 grs.

Extractum Ergotæ Liquidum 1 in 1.

A deep coffee-brown liquid, obtained by exhausting 20 ozs. of ergot with $7\frac{1}{2}$ pints of water, evaporating this to 14 ozs., and adding $7\frac{1}{2}$ ozs. alcohol (90 per cent.)

Dose—10 to 30 minims, in water.

Infusum Ergotæ 1 in 20 ($\frac{1}{4}$ hour).

1 oz. crushed ergot infused in 1 pint boiling distilled water.

Dose—1 to 2 ozs.

Injectio Ergotæ Hypodermica 10 grs. in 33 mins.

(Synonym—Hypodermic Injection of Ergotin.)

100 grs. extract of ergot dissolved in a mixture of 3 grs. phenol and 220 minims distilled water which has been boiled and cooled. It should measure 330 minims, and should be freshly prepared.

Dose—By subcutaneous injection, 3 to 10 minims.

Tinctura Ergotæ Ammoniata 1 in 4.

A coffee-brown liquid, prepared by percolating 5 ozs. finely comminuted ergot with a mixture of 2 ozs. solution of ammonia and 18 ozs. alcohol (60 per cent.).

Dose—$\frac{1}{2}$ to 1 dr.

ETHER—(See under Æther).

ETHYL NITRITIS, LIQUOR (Solution of Ethyl Nitrite).

A colourless, limpid solution in 95 per cent. absolute alcohol and 5 per cent. glycerin, of 3 per cent., by weight, of ethyl nitrite, which is obtained by interaction of alcohol (90 per cent.), sodium nitrite, and diluted sulphuric acid, at low temperatures. Should be stored in small bottles.

Acts, like amyl nitrite, on arterial spasm.

Dose—20 to 60 minims.

EUCALYPTI GUMMI (Eucalyptus Gum)—Myrtaceæ.

The ruby-coloured exudation or so-called red gum from the bark of Eucalyptus rostrata and other species; from Australia.

Astringent like catechu. Dose—2 to 5 grs.

Trochiscus Eucalypti Gummi 1 gr. in each.

A lozenge, consisting of 1 gr. eucalyptus gum with fruit basis.

EUCALYPTI OLEUM (Oil of Eucalyptus)—Myrtaceæ.

The colourless or pale yellow oil distilled from the fresh leaves of Eucalyptus Globulus and other species.

A powerful Antiseptic. Dose—$\frac{1}{2}$ to 3 minims.

Unguentum Eucalypti 1 in 10.

A white ointment, prepared by melting white soft paraffin 5 ozs. and hard paraffin 4 ozs., and adding eucalyptus oil 1 oz.

Antiseptic.

EUONYMI CORTEX (Euonymus Bark)—Celastraceæ.

The dried root-bark of Euonymus atropurpureus (Wahoo), in quilled or curved pieces ($\frac{1}{12}$—$\frac{1}{8}$ inch thick), outer surface ash grey, and inner surface whitish.

Extractum Euonymi Siccum (Dry Extract of Euonymus).

A brownish powder, prepared by evaporating a tincture of the dried bark and adding 25 per cent. of calcium phosphate. Known as Euonymin.

Cholagogue and Cathartic. Dose—1 to 2 grs.

FEL BOVINUM PURIFICATUM (Purified Ox Bile).

A dark-green, soft solid, prepared by evaporating fresh ox bile to $\frac{1}{4}$ its volume, adding twice its bulk of alcohol (90 per cent.), filtering, and continuing the evaporation.

Tonic, Aperient, and Antiseptic. Dose—5 to 15 grs., in pill.

FERRUM (Iron)—Fe

Annealed iron wire (No. 35 gauge, about 0·005 inch in diameter) or wrought nails, free from oxide. The different preparations of this substance vary in their actions. Pure iron,

for example, acts simply as a Tonic and Hæmatinic or blood improver, whilst the acid preparations are generally powerful Astringents as well. Iron forms a dark ink when ordered with any of the bitter infusions, except those of Quassia and Calumba. The same remark applies to all astringent vegetable tinctures. Iron, like arsenic, should be prescribed to be taken after meals.

Liquor Ferri Acetatis Solution of Ferric Acetate (9·5 per cent.)

A deep-red fluid, prepared by dissolving ferric hydrate (formed by precipitating solution of ferric sulphate with ammonia) in glacial acetic acid and water.

Astringent, Tonic, and Diuretic. Dose—5 to 15 minims.

Ferri Arsenas (Iron Arsenate). Arseniate of Iron, B.P., 1885. Ferrous Arsenate $Fe_3(AsO_4)_2 6H_2O$, with ferric arsenate and some iron oxide. A green, amorphous powder, prepared by mixing a solution of sodium arsenate with one of ferrous sulphate, adding sodium bicarbonate in solution, and drying the precipitate at a low temperature.

Resembles arsenic in its action. Dose—$\frac{1}{16}$ to $\frac{1}{4}$ gr., in pill.

Ferri Carbonas Saccharatus

Saccharated Iron Carbonate. Ferrous oxycarbonate, $x\,FeCO_3$, $y\,Fe(OH)_2$, more or less oxidised and mixed with sugar; the carbonate, $FeCO_3$, forming about $\frac{1}{3}$ of the mixture. A greyish-brown powder, cohering in little lumps, prepared by mixing solutions of ammonium carbonate and ferrous sulphate, washing the resulting carbonate, rubbing it up with sugar, and drying.

Dose—10 to 30 grs.

Mistura Ferri Composita $2\frac{1}{2}$ grs. sulphate to 1 oz.

A muddy, green, changeable mixture, prepared by mixing myrrh and sugar, of each 60 grs., potassium carbonate 30 grs., spirit of nutmeg 50 mins., in rose water to 7 ozs., and adding ferrous sulphate 25 grs. dissolved in rose water 3 ozs. Commonly called Griffith's Mixture; it contains about 1 gr. carbonate of iron in each ounce.

Hæmatinic and Emmenagogue. Dose—$\frac{1}{2}$ to 1 oz.

Ferri et Ammonii Citras

Iron and Ammonium Citrate in transparent ruby scales, prepared by mixing solutions of ferric sulphate and ammonia, and dissolving the freshly-precipitated ferric hydroxide thus formed in solution of citric acid, and, after the addition of ammonia, evaporating.

Dose—5 to 10 grs.; a most agreeable tonic, in solution.

Vinum Ferri Citratis 8 grs. in 1 oz.

A brownish liquid, prepared by dissolving 160 grs. iron and ammonium citrate in orange wine to 1 pint.

Dose—1 to 4 drs.

Ferri et Quininæ Citras (Iron and Quinine Citrate). 1 gr. Quinine in 6.

In greenish-yellow scales, being a citrate of Quinine, Iron, and Ammonium, prepared by dissolving the ferric hydroxide (formed as in the last preparation) in citric acid, adding quinine (prepared by precipitating the sulphate by ammonia), neutralising with ammonia, and evaporating.

Hæmatinic, Tonic, Antiperiodic. Dose—5 to 10 grs.

Syrupus Ferri Iodidi 1 gr. in 11 mins.

A colourless syrup, prepared by heating ½ oz. iron and 726 grs. iodine with 2½ ozs. distilled water, and adding the filtered product to 16½ ozs. sugar dissolved in 6 ozs. water, and making up to 1 pint with water.

Dose—½ to 1 dr. Dose for a child 1 year old, 2 mins.

Liquor Ferri Perchloridi Fortis 22·5 grs. in 110 mins.

A deep orange-brown liquid, prepared by boiling iron wire in hydrochloric acid and distilled water, and, after filtering, adding nitric acid and more hydrochloric, and concentrating by evaporation.

A powerful Astringent, Caustic, and Hæmostatic.

Liquor Ferri Perchloridi Solution of Ferric Chloride 1 in 4.

A brown liquid, prepared by mixing 5 ozs. strong solution of ferric chloride with distilled water to make 1 pint.

Dose—5 to 15 minims, freely diluted.

Tinctura Ferri Perchloridi 1 in 4.

A brown liquid, prepared by adding 5 ozs. strong solution of ferric chloride to 5 ozs. alcohol (90 per cent.) and distilled water to 1 pint.

Dose—5 to 15 minims, freely diluted.

Liquor Ferri Pernitratis 3·3 grs. in 110 mins.

A reddish-brown liquid, prepared by dissolving 1 oz. iron wire in 4½ ozs. nitric acid and distilled water to 30 ozs.

Dose—5 to 15 minims, freely diluted.

Ferri Phosphas 47 per cent. hydrous ferrous phosphate ($Fe_8(PO_4)_2 8H_2O$) with ferric phosphate and some iron oxide.

A slate-blue amorphous powder, prepared by mixing a solution of ferrous sulphate with one of sodium phosphate, and adding

sodium bicarbonate, in solution, and drying the washed precipitate.

Dose—5 to 10 grs., in powder.

Syrupus Ferri Phosphatis 1 gr. $Fe_3(PO_4)_2$ in 1 dr.

A colourless syrup, prepared by dissolving by heat iron wire in concentrated phosphoric acid and distilled water, and filtering into syrup.

Dose—½ to 1 dr. diluted, in anæmic dyspepsia.

Syrupus Ferri Phosphatis cum Quinina et Strychnina 1 gr., $\frac{4}{5}$ gr., and $\frac{1}{32}$ gr. in 1 dr.

A clear fluorescent syrup, made by dissolving iron wire in concentrated phosphoric acid, and in this dissolving quinine sulphate and strychnine, and filtering into syrup and adding water, the whole containing 1 gr. anhydrous ferrous phosphate, $\frac{4}{5}$ gr. quinine sulphate, and $\frac{1}{32}$ gr. strychnine in 1 dr.

General and Nervine Tonic. Dose—½ to 1 dr.

Ferri Sulphas $FeSO_4,7H_2O$ (Ferrous Sulphate)

Pale, greenish-blue crystals, prepared by interaction of diluted sulphuric acid and iron.

Tonic, Astringent, and Emmenagogue. Dose—1 to 5 grs.

Ferri Sulphas Exsiccatus (Exsiccated Ferrous Sulphate) $FeSO_4,H_2O$ Dried Sulphate of Iron, B.P., 1885.

A greyish powder, prepared by heating the last preparation at 212° till it loses 40 per cent. of its weight, and powdering the residue. 2½ grs. = 4 grs. Ferri Sulphas.

Dose—½ to 3 grs., in pill.

In—Pil. Aloes et Ferri, and

Pilula Ferri (Iron Pill) 1 gr. *carbonate* in 5.

Prepared by mixing 150 grs. exsiccated ferrous sulphate, 150 grs. syrup, 10 grs. glycerin, and 20 grs. water, and adding 95 grs. exsiccated sodium carbonate, and when reaction ceases adding 50 grs. gum acacia and 15 grs. tragacanth. Known as Blaud's Pill.

Tonic and Emmenagogue. Dose—5 to 15 grs.

Liquor Ferri Persulphatis (Solution of Ferric Sulphate) $Fe_2 3SO_4$ 36½ per cent.

A dense dark-red liquid, prepared by dissolving 8 ozs. ferrous sulphate in 6 drs. sulphuric acid and 10 ozs. distilled water, and adding 6 drs. nitric acid in 2 ozs. distilled water, and making up to 11 ozs. after converting all the sulphate into persulphate by boiling.

Styptic ; used in making 4 preparations of iron.

Vinum Ferri 1 oz. to 1 pint.

A brown liquid, prepared by *partially immersing* 1 oz. iron wire in 1 pint of sherry for a month, with frequent agitation.

Dose—1 to 4 drs.; contains a small amount of iron, chiefly as tartrates, malates, and citrates.

Ferrum Redactum (Reduced Iron) Fe and Fe_3O_4

A fine black powder, containing at least 75 per cent. of metallic iron and a variable amount of oxide, prepared by passing dry hydrogen over red-hot ferric hydroxide.

Tonic and Hæmatinic; sometimes called Quevenne's iron.

Dose—1 to 5 grs. in pill.

Trochiscus Ferri Redacti 1 gr. in each.

A greyish-black lozenge, consisting of reduced iron 1 gr., mixed with simple basis.

Ferrum Tartaratum (Tartarated Iron) $KFeOC_4H_4O_6$

In deep garnet scales, prepared by dissolving freshly precipitated ferric hydroxide (deposited from ferric sulphate solution by ammonia) with acid potassium tartrate in water, filtering and evaporating to a syrup, and drying on plates.

Dose—5 to 10 grs., in solution in water.

☞ The double salts of iron with potassium, quinine, and ammonium, are known as the *scale* preparations of iron from their physical characteristics.

FICUS (Fig)—Urticaceæ, or Moraceæ.

The dried, fleshy receptacles of Ficus Carica.

Laxative; used in making Confectio Sennæ.

FILIX MAS (Male Fern)—Filices.

The tufted, scaly, greenish-brown rhizome, with persistent bases of the foot-stalks, and root-fibres of Aspidium Filix-mas. Collected late in the autumn, and divested of roots, leaves, and dead matter, and carefully dried. Should not be used if more than 1 year old.

Active principle—Filicic Acid.

Extractum Filicis Liquidum

A thick, dark-green, oily liquid, prepared by extracting the oleo-resinous matter from the male fern rhizome by percolating it with ether, and evaporating the ethereal tincture.

Anthelmintic—for *tænia solium*. Dose—45 to 90 minims, in emulsion.

FŒNICULI FRUCTUS (Fennel Fruit)—Umbelliferæ.

The dried, pale-brown, oblong, ribbed, seed-like, beaked, ripe fruit of cultivated plants of Fœniculum capillaceum.

Carminative, Antispasmodic, and Galactagogue.

In—Pulvis Glycyrrhizæ Compositus.

Aqua Fœniculi 1 lb. to 1 gallon.

A colourless water, obtained by distilling one gallon from 2 gallons of water, and 1 pound fennel fruit.

Dose—1 to 3 ozs. For a child one year old, 1 dr.

GALBANUM (Galbanum)—Umbelliferæ.

A fetid, greenish-yellow gum resin, in small tears agglutinated into masses, derived from Ferula galbaniflua, and probably other species.

Antispasmodic and Expectorant. Dose—5 to 15 grs.

Pilula Galbani Composita 1 in $3\frac{1}{2}$.

(Synonym—Compound Pill of Asafetida.)

Composed of asafetida, galbanum, and myrrh, of each 2 ozs., and syrup of glucose 1 oz., heated together.

Antispasmodic in hysteria. Dose—4 to 8 grs.

GALLA (Galls)—From Cupuliferæ.

A partially insect and partially vegetable production, growing as round, tuberculated excrescences on the oak, Quercus infectoria, and resulting from the puncture and deposition of an egg or eggs of Cynips Gallæ tinctoriæ.

Active ingredients—Gallo-tannic Acid and Gallic Acid.

Astringent. Generally given in the form of tannin.

Unguentum Gallæ 1 in 5.

A pale-brown ointment, prepared by rubbing 1 oz. powdered galls with 4 ozs. benzoated lard.

Astringent. Chiefly used for hæmorrhoids.

Unguentum Gallæ cum Opio $7\frac{1}{2}$ per cent. opium.

A brown ointment, prepared by mixing 75 grs. powdered opium with 925 grs. ointment of galls.

A Local Anodyne and Astringent to painful hæmorrhoids.

Gallic and Tannic Acids (See under Acidum).

GELATINUM (Gelatin).

In translucent sheets or shreds, being the air-dried product of the action of boiling water on such animal tissues as skin, tendons, ligaments, and bones; used for making suppositoria glycerini.

GELSEMII RADIX (Gelsemium Root)—Loganiaceæ.

The dried yellowish-brown cylindrical rhizome marked with longitudinal purple lines and attached roots of Gelsemium nitidum.

Active principle—Gelsemine.

Sedative in Neuralgia of 5th nerve.

Tinctura Gelsemii 1 in 10.

2 ozs. gelsemium root in No. 40 powder, percolated with alcohol (60 per cent.) to make 1 pint.

Dose—5 to 15 minims.

GENTIANÆ RADIX (Gentian Root)—Gentianaceæ.

The tough, wrinkled, or ringed brownish-yellow, dried rhizome and roots of Gentiana lutea, in cylindrical pieces or longitudinal slices.

Active principle—Gentio-picrin (a glucoside).

Bitter Tonic, without astringency.

☞ This root is often confounded with Belladonna and Pyrethrum. From the former it is distinguished by its brownish-yellow colour, and by the close, transverse markings, which give it a ringed appearance. It differs from pyrethrum in its toughness, and in the absence of the black, shining points seen in the thick, brittle bark. Gentian is bitter, while pyrethrum causes a prickling sensation in the mouth.

Extractum Gentianæ

A brownish-black, soft extract, prepared by infusing and afterwards boiling the root in water and evaporating.

Dose—2 to 8 grs. A harmless excipient for pill masses.

Infusum Gentianæ Compositum 1 in 80 ($\frac{1}{4}$ hour).

$\frac{1}{4}$ oz. each gentian root and dried bitter-orange peel, and $\frac{1}{2}$ oz. fresh lemon peel, infused in 1 pint boiling water.

Dose—$\frac{1}{2}$ to 1 oz.

Tinctura Gentianæ Composita 1 in 10.

A golden-brown liquid, prepared by macerating in 1 pint alcohol (45 per cent.) 2 ozs. gentian root, $\frac{3}{4}$ oz. dried bitter-orange peel, and $\frac{1}{4}$ oz. cardamom seeds.

Dose—$\frac{1}{2}$ to 1 dr.

GLUCOSI SYRUPUS (Syrup of Glucose) 1 in 3.

Made by mixing and heating 1 oz. liquid glucose of commerce and 2 ozs. syrup.

Used as an excipient in 9 pills.

GLUSIDUM (Gluside) C_6H_4CO,SO_2,NH

(Synonym - Glucusimide).

Benzoyl sulphonimide; an intensely sweet white crystalline powder, being an imide derived from toluene. Commonly called Saccharin.

Only used as a substitute for sugar.

☞ Soluble Saccharin is prepared by evaporating a neutral solution of gluside in bicarbonate of soda.

GLYCERINUM (Glycerin) $C_3H_5(HO)_3$

Glycerin or glycerol is a colourless, oily-looking, thick, sweet fluid, obtained from fats and fixed oils by interaction with

alkalies or superheated steam. It is a trihydric alcohol containing a small percentage of water.

Demulcent, Antiseptic, and Emollient. Dose—1 to 2 drs.

Suppositoria Glycerini 70 per cent.

Translucent cones, prepared by soaking gelatin ½ oz. in a little water till it becomes soft, and then dissolving it in glycerin 2½ ozs. and evaporating till the mixture weighs 1,563 grs., when it is poured into moulds capable of holding 30, 60, or 120 grs. or other capacity. Each suppository contains 70 per cent. of glycerin.

Used for inserting into the rectum in constipation.

In addition to entering into the 9 Glycerins, it enters into Lin. Pot. Iod. cum Sapone, Mel Boracis, Pil. Ferri, Pil. Quin. Sulph., Confect. Sulphuris, Ext. Cinch. Liq., Ext. Sarzæ Liq., Liq. Thyroidei, Liq. Ethyl Nitritis, Lotio Hyd. Nig., Syr. Pruni Virg., Tinct. Chlor. et Morph. Co., Tr. Kino, Tr. Rhei Co., Ung. Ac. Carbolic., Ung. Iodi, and Ung. Sulph. Iod.

Glycerinum Acidi Carbolici, &c. (See under Acidum Carbolicum, &c. ; or the table upon page 163).

GLYCYRRHIZÆ RADIX (Liquorice Root)—Leguminosæ.

The pale-yellow, tough, fibrous peeled root and underground stem, in long cylindrical pieces, of Glycyrrhiza glabra, and other species.

Active principle—Glycyrrhizin.

Demulcent ; but chiefly used for its sweetening qualities.

A mild Cathartic.

☞ This root is distinguished from others by its *yellow* and *fibrous* interior, and by its very sweet taste.

Extractum Glycyrrhizæ

A firm, black extract, prepared by maceration of the root in cold distilled water, boiling, straining, and subsequent evaporation.

Chiefly used as an Excipient.

In—Confect. Sennæ and Dec. Aloes Co.

Extractum Glycyrrhizæ Liquidum

A dark liquid, prepared by boiling a cold infusion of the root, straining, and evaporating till the specific gravity of 1·20 is reached, and then adding ¼ its volume of alcohol (90 per cent.).

Dose—½ to 1 dr.

In—Mist. Sennæ Co. and Tr. Aloes.

Pulvis Glycyrrhizæ Compositus 1 in 6.

A greenish powder, consisting of senna and liquorice, of each 2 ozs., fennel and sulphur, of each 1 oz., sugar 6 ozs.

A mild Cathartic. Dose—60 to 120 grs.

In addition to the above, liquorice root enters into Liq. Sarzæ Co. Conc., and Pil. Hydrarg.

GOSSYPIUM (Cotton)—Malvaceæ.

(Synonym—Cotton Wool).

White, soft filaments or hairs of the seed of Gossypium barbadense, and other species of gossypium; freed from fatty matter.

Used in making Pyroxylin.

GRANATI CORTEX (Pomegranate Bark)—Myrtaceæ.

The greyish-yellow fragments of the dried bark of the stem and root of Punica Granatum.

Active Principle—Punicine or Pelletierine.

Anthelmintic; used to destroy the tapeworm.

Decoctum Granati Corticis 1 in 5.

Prepared by taking 4 ozs. of the bark of pomegranate and 24 ozs. of water, and boiling down to 1 pint.

Dose—½ to 2 ozs. every 4 hours. It causes purging.

GUAIACI LIGNUM (Guaiacum Wood)—Zygophyllaceæ.

The dark greenish-brown heart-wood of Guaiacum officinale, or of G. sanctum. (Known as Lignum Vitæ.)

Diaphoretic and Alterative.

In—Liq. Sarzæ Co. Conc.

GUAIACI RESINA (Guaiacum Resin).

The resin from the stem of Guaiacum officinale, or of G. sanctum, in large greenish-brown masses or oval tears.

Diaphoretic and Antisyphilitic. Dose—5 to 15 grs.

Mistura Guaiaci 11 grs. in 1 oz.

An emulsion, prepared by rubbing ½ oz. each guaiacum resin and sugar, and 35 grs. tragacanth, with 1 pint cinnamon water.

Dose—½ to 1 oz.

Tinctura Guaiaci Ammoniata 1 in 5.

A dark-brown liquid, prepared by macerating 4 ozs. of guaiacum resin in 16 ozs. alcohol (90 per cent.), and 1½ ozs. strong solution of ammonia, for 48 hours, filtering, and dissolving in the filtrate 30 minims oil of nutmeg, and 20 minims oil of lemon, and making up to 1 pint with alcohol (90 per cent.)

Stimulant and Diaphoretic. Dose—½ to 1 dr.

Trochiscus Guaiaci Resinæ 3 grs. in each.

Lozenges composed of fruit basis with 3 grs. guaiacum resin in each.

In addition to the above, the resin enters into Pil. Hydrarg. Subchlor. Co.

HÆMATOXYLI LIGNUM (Logwood)—Leguminosæ.

The dark-red logs or iridescent chips or raspings of the heart-wood of Hæmatoxylon campechianum.

Colouring principle—Hæmatoxylin.

Astringent principle—Tannic Acid.

A pure Astringent.

Decoctum Hæmatoxyli 1 in 20.

Prepared by boiling 1 oz. logwood in 24 ozs. distilled water for 10 minutes, adding 70 grs. cinnamon near the end of the process, and making the strained product to measure 1 pint.

Dose—½ to 2 ozs.

HAMAMELIDIS CORTEX (Hamamelis Bark)—Hamamelidaceæ.

(Synonym—Witch Hazel Bark).

The dried bark of Hamamelis virginiana in quills or curved pieces 2 to 8 inches long; externally scaly, whitish, or silvery grey; internally cinnamon-brown and striated.

Tinctura Hamamelidis 1 in 10.

Prepared by percolating 2 ozs. witch hazel bark with 1 pint alcohol (45 per cent.)

Astringent. Dose—½ to 1 dr.

Hamamelidis Folia (Synonym—Witch Hazel Leaves).

The fresh and dried leaves of Hamamelis virginiana or witch hazel. Oval, 3 to 6 inches long, with an oblique, heart-shaped base.

Extractum Hamamelidis Liquidum 1 in 1.

Prepared by a mixed process of maceration and percolation by exhausting the powdered leaves with alcohol (45 per cent.), reserving a portion of the resulting tincture, evaporating the remainder to the consistence of a soft extract, and dissolving it in the reserved portion.

Astringent. Dose—5 to 15 minims.

Liquor Hamamelidis 1 in 1.

Solution of hamamelis, prepared by macerating and distilling 55 ozs. from fresh hamamelis leaves 50 ozs., water 100 ozs., and alcohol (90 per cent.) 10 ozs.

Unguentum Hamamelidis 1 in 10.

Prepared by mixing ¼ oz. liquid extract of hamamelis with 2¼ ozs. hydrous wool fat.

An Astringent application for inflamed piles.

HEMIDESMI RADIX (Hemidesmus Root)—Asclepiadaceæ.

The brownish, cylindrical, tortuous dried root of Hemidesmus indicus, marked with annular cracks; sometimes called Indian Sarsaparilla. Supposed to possess the properties of Sarsaparilla.

Syrupus Hemidesmi 1 in 8 (by measure).

A syrup, prepared by dissolving 28 ozs. sugar in an infusion of 4 ozs. hemidesmus root in 1 pint boiling water.

Dose—½ to 1 dr. Used as a pleasant addition to cough mixtures.

HIRUDO (Leeches)—Class, Annelida.

Two leeches are official—the green leech (Sanguisuga officinalis) and the speckled leech (S. medicinalis), the former having an olive-green and the latter a greenish-yellow spotted belly. *Both* species have six rusty-red longitudinal stripes on the back, which distinguish them from the horse-leech and others.

HOMATROPINÆ HYDROBROMIDUM (Homatropine Hydrobromide) $C_{16}H_{21}NO_3,HBr$

Hydrobromate of Homatropine, B.P. Add., 1890.

The hydrobromide of an alkaloid, prepared from tropine, in minute colourless crystals.

Mydriatic and Anhidrotic. Dose—$\frac{1}{80}$ to $\frac{1}{20}$ gr.

Lamellæ Homatropinæ (Discs of Homatropine) $\frac{1}{100}$ gr. in each.

Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{100}$ gr. of homatropine hydrobromide.

HYDRARGYRUM (Mercury) Hg.

A lustrous silver-white fluid metal 13½ times heavier than water, obtained from native mercuric sulphide.

Hydrargyrum cum Creta 1 in 3.

(Synonym—Grey Powder).

A greyish-blue powder, prepared by rubbing 1 oz. mercury with 2 ozs. prepared chalk.

Alterative. Dose—1 to 5 grs. For a child 1 year old, 1 gr.

Emplastrum Hydrargyri 1 in 3.

A bluish solid, prepared by rubbing 3 ozs. mercury with a heated mixture of 56 grs. olive oil and 8 grs. sulphur, and adding 6 ozs. melted lead plaster (the sulphur aiding the division of the mercury).

Resolvent. This preparation sometimes affects the system.

Emplastrum Ammoniaci cum Hydrargyro 1 in 5 of Hg.

A dirty-blue coloured solid, composed of 3 ozs. mercury, 12 ozs. ammoniacum, 56 grs. olive oil, and 8 grs. sulphur.

Resolvent and Local Stimulant.

Linimentum Hydrargyri 1 in 3 of Ungt., 1 in 6 of Hg.

A thick lead-coloured liquid, composed of ointment of mercury 1 oz., strong solution of ammonia 160 mins., and camphor liniment to 3 ozs.

A Stimulant to chronic enlargements.

Pilula Hydrargyri 1 in 3. (Synonym—Blue Pill.)

Prepared by rubbing 2 ozs. (by weight) mercury with 3 ozs. confection of roses, and adding 1 oz. liquorice in fine powder.

Dose—4 to 8 grs.

Unguentum Hydrargyri 1 in 2.

Prepared by rubbing together 1 lb. of mercury, 1 lb. of lard, and 1 oz. suet. Called sometimes Blue ointment from its colour.

Used to introduce mercury into the system through the skin.

☞ There are 10 ointments bearing the name of mercury. (Page 181.)

Unguentum Hydrargyri Compositum 1 of Hg. in 5.

A bluish ointment, consisting of ointment of mercury 10 ozs., yellow beeswax and olive oil, of each 6 ozs., camphor 3 ozs.

This is a substitute for Scott's ointment, by which name it is also known.

Hydrargyri Iodidum Rubrum (Mercuric Iodide) HgI_2

(Synonym—Biniodide of Mercury).

A crystalline, vermillion powder, precipitated on mixing solutions of mercuric chloride and potassium iodide.

Irritant and Vesicant. Dose—$\frac{1}{32}$ to $\frac{1}{16}$ gr. in pill.

Unguentum Hydrargyri Iodidi Rubri 1 in 25.

(Synonym—Ointment of Red Iodide of Mercury.)

A brilliant red ointment, prepared by mixing 20 grs. mercuric iodide with 480 grs. benzoated lard.

Absorbent and Rubefacient.

Liq. Arsenii et Hydrargyri Iodidi

Donovan's Solution. (See Acid. Arsenios., page 185).

Liquor Hydrargyri Nitratis Acidus (Acid Solution of Mercuric Nitrate) 48 per cent.

A colourless solution of 4 ozs. mercury in 5 ozs. nitric acid and $1\frac{1}{2}$ ozs. distilled water.

Caustic ; not used internally.

Unguentum Hydrargyri Nitratis (Mercuric Nitrate Ointment) 1 in 16 nearly.

(Synonym—Ointment of Nitrate of Mercury). Prepared by adding a solution of 1 oz. mercury in 3 ozs. nitric acid to a hot mixture of 4 ozs. lard and 7 ozs. olive oil. Known as Citrine Ointment from its pale lemon colour.

A local Alterative, Astringent, and Stimulant.

Unguentum Hydrargyri Nitratis Dilutum 1 in 5.

(Synonym—Diluted Ointment of Nitrate of Mercury).

1 oz. mercuric nitrate ointment and 4 ozs. soft paraffin (yellow).

Hydrargyri Oleas (Mercuric Oleate).

A light greyish-yellow unctuous substance, prepared by the interaction of mercuric chloride with sodium oleate made by mixing hard soap and oleic acid.

Action same as that of Ointment of Mercury.

Unguentum Hydrargyri Oleatis 1 in 4.

Prepared by mixing mercuric oleate 1 oz. with benzoated lard 3 ozs.

Hydrargyri Oxidum Flavum (Yellow Mercuric Oxide) HgO

A yellow powder, prepared by mixing solutions of mercuric chloride and sodium hydroxide.

It has the same composition as Hyd. Ox. Rub., only it exists in a state of more minute division.

Absorbent; not taken internally.

Unguentum Hydrargyri Oxidi Flavi 1 in 50.

A yellow ointment, prepared by mixing 10 grs. yellow mercuric oxide, in very fine powder, with 490 grs. yellow soft paraffin.

Used in ophthalmia.

Hydrargyri Oxidum Rubrum (Red Mercuric Oxide) HgO

Called also Red Precipitate. An orange-red powder, prepared by heating mercurous nitrate until acid vapours cease to be evolved.

Unguentum Hydrargyri Oxidi Rubri 1 in 10.

(Synonym—Red Precipitate Ointment).

A red ointment, composed of red mercuric oxide $\frac{1}{4}$ oz., paraffin ointment (yellow) $2\frac{1}{4}$ ozs.

A local Stimulating Absorbent.

Hydrargyri Perchloridum (Mercuric Chloride) $HgCl_2$

(Synonyms—Corrosive Sublimate; Bichloride of Mercury; Perchloride of Mercury).

In heavy colourless masses of prismatic crystals, prepared by

subliming a mixture of mercuric sulphate, sodium chloride, and a little black oxide of manganese.

Alterative, Antisyphilitic, and powerfully Antiseptic. In even small quantity an irritant poison.

Dose— $\frac{1}{32}$ to $\frac{1}{16}$ grain in plain solution.

Liquor Hydrargyri Perchloridi $\frac{1}{2}$ gr. in 1 oz.

A colourless solution of 10 grs. mercuric chloride in 1 pint distilled water.

Dose—$\frac{1}{2}$ to 1 drachm, diluted. Each drachm contains $\frac{1}{16}$ gr.

Lotio Hydrargyri Flava (Yellow Mercurial Lotion) 2 grs. in 1 oz.

(Synonym—Yellow Wash.)

Prepared by adding 20 grs. mercuric chloride to 10 ozs. solution of lime (the yellow oxide—HgO—falls as a precipitate).

Resembles the yellow and red oxides in action.

Hydrargyri Subchloridum (Mercurous Chloride) Hg_2Cl_2

(Synonyms—Hydrargyri Chloridum ; Calomel ; Subchloride of Mercury).

A dull-white heavy powder, prepared by subliming mercurous sulphate and sodium chloride.

Alterative, Purgative, and Diuretic.

Dose—$\frac{1}{2}$ to 5 grs. For a child 1 year old, 1 gr.

Lotio Hydrargyri Nigra (Black Mercurial Lotion) 3 grs. in 1 oz.

(Synonym—Black Wash.)

Prepared by triturating 30 grs. mercurous chloride with $\frac{1}{2}$ oz. glycerin and $1\frac{1}{4}$ oz. mucilage of tragacanth, and adding in portions, solution of lime to make 10 ozs., the black precipitate which falls being Hg_2O.

A Stimulating Alterative to syphilitic sores.

Pilula Hydrargyri Subchloridi Composita 1 in $4\frac{1}{2}$.

(Synonyms—Compound Calomel Pill ; Plummer's Pill.)

An orange mass, prepared by beating together 1 oz. each mercurous chloride and sulphurated antimony, 2 ozs. guaiacum resin, 180 grs. castor oil, and 1 dr. alcohol (90 per cent.).

Dose—5 to 10 grs., as an Alterative and feeble Cathartic.

Unguentum Hydrargyri Subchloridi 1 in 10.

(Synonym—Calomel Ointment.)

A white ointment, prepared by mixing $\frac{1}{4}$ oz. mercurous chloride (calomel) and $2\frac{1}{4}$ ozs. benzoated lard.

Alterative and Resolvent, but seldom used.

Hydrargyrum Ammoniatum NH_2HgCl

(Synonyms—Ammonio-chloride of Mercury; White Precipitate; Mercuric-ammonium Chloride). A white powder, prepared by mixing solutions of mercuric chloride and of ammonia, and washing and drying the precipitate.

Used as an Insecticide, and never taken internally.

Unguentum Hydrargyri Ammoniati 1 in 10.

(Synonym—White Precipitate Ointment.) 1 oz. ammoniated mercury, mixed with 9 ozs. paraffin ointment (white).

A Stimulant in chronic skin diseases, and to destroy pediculi.

HYDRASTIS RHIZOMA (Hydrastis Rhizome)—Ranunculaceæ.

The dried, twisted, and knotted yellowish-brown rhizome and roots of Hydrastis canadensis.

Active principles—Hydrastine and Berberine.

Tonic and Alterative to mucous membranes.

Extractum Hydrastis Liquidum 1 in 1.

Prepared by a mixed process of percolation and maceration by exhausting the rhizome with alcohol (45 per cent.), reserving a portion of the resulting tincture and evaporating the remainder to the consistence of a soft extract, and then dissolving this in the reserved portion.

Dose—5 to 15 minims.

Tinctura Hydrastis 1 in 10.

Prepared by percolating 2 ozs. hydrastis rhizome with alcohol (60 per cent.) to make 1 pint.

Dose—½ to 1 dr.

HYDROGENII PEROXIDI LIQUOR 10 vols. H_2O_2

An aqueous solution of hydrogen peroxide, prepared by interaction of water, barium peroxide, and a dilute mineral acid at a temp. below 50°F. Should yield 10 times its volume of oxygen.

Dose—½ to 2 drs.

HYOSCYAMI FOLIA (Hyoscyamus Leaves)—Solanaceæ.

(Synonym—Henbane Leaves.) The sinuated, hairy, *dried* leaves and flowering tops of Hyoscyamus niger, also the *fresh* leaves and flowers, with their branches—gathered from *biennial* flowering plants.

Active principles—Hyoscine and Hyoscyamine.

Narcotic, Anodyne, and Sedative.

Extractum Hyoscyami Viride

A dark, soft mass, prepared by the evaporation of the juice of the fresh leaves, flowering tops and young branches of henbane,

by a process identical with that used for making the Green Extract of Belladonna.

Dose—2 to 8 grs.

Pil. Colocynthidis et Hyoscyami (See Colocynth).

Succus Hyoscyami

The juice of the fresh leaves, flowering tops and young branches of biennial plants, to which $\frac{1}{3}$ of its volume of alcohol (90 per cent.) is added.

Dose—$\frac{1}{2}$ to 1 dr.

Tinctura Hyoscyami 1 in 10.

A greenish-brown liquid, prepared by percolating 2 ozs. hyoscyamus leaves and flowering tops with alcohol (45 per cent.) to make 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

HYOSCINÆ HYDROBROMIDUM (Hyoscine Hydrobromide) $C_{17}H_{21}NO_4,HBr,3H_2O$.

(Synonyms—Scopolamine Hydrobromide; Hydrobromate of Hyoscine.)

The hydrobromide of an alkaloid contained in hyoscyamus leaves, different species of Scopola, and other solanaceous plants. In colourless crystals, permanent in the air and very soluble in water.

Hypnotic. Dose—$\frac{1}{200}$ to $\frac{1}{100}$ gr.

HYOSCYAMINÆ SULPHAS (Hyoscyamine Sulphate) $(C_{17}H_{23}NO_3)_2,H_2SO_4,2H_2O$.

A deliquescent crystalline powder, being the sulphate of an alkaloid contained in hyoscyamus leaves, and possibly other solanaceous plants.

Hypnotic. Dose—$\frac{1}{200}$ to $\frac{1}{100}$ gr.

IODOFORMUM (Iodoform or Tri-iodomethane) CHI_3

Shining lemon-yellow crystalline scales, produced by the action of iodine on ethylic alcohol and solution of potassium carbonate.

Antiseptic and Alterative. Dose—$\frac{1}{2}$ to 3 grs. in pill.

Suppositoria Iodoformi 3 grs. in each.

Iodoform 36 grs., oil of theobroma 144 grs., divided into 12 suppositories.

Unguentum Iodoformi 1 in 10.

Iodoform $\frac{1}{4}$ oz. mixed with paraffin ointment (yellow) $2\frac{1}{4}$ ozs.

Disinfectant, Antiseptic, and Antisyphilitic.

IODUM (Iodine) I

A non-metallic element, in dark, lustrous, laminar crystals, obtained from the ashes of sea-weeds, and from native iodides and iodates.

Lymphatic Stimulant, Absorbent, Alterative, and Caustic.

Starch and free ammonia are incompatible with iodine preparations.

Liquor Iodi Fortis (Strong Solution of Iodine) 1 in 9.

Liniment of Iodine, B.P., 1885.

A dark, reddish-brown liquid, prepared by dissolving iodine $1\frac{1}{4}$ ozs., potassium iodide $\frac{3}{4}$ oz., in water $1\frac{1}{4}$ ozs., and adding alcohol (90 per cent.) 9 ozs. About $4\frac{1}{2}$ times the strength of the tincture.

Absorbent and Counter-irritant.

Tinctura Iodi 1 in 40.

A deep-red liquid, prepared by dissolving iodine $\frac{1}{2}$ oz., potassium iodide $\frac{1}{2}$ oz., in water $\frac{1}{2}$ oz., and adding alcohol (90 per cent.) to make 1 pint.

Dose—2 to 5 minims, diluted.

Unguentum Iodi 1 in 25.

A brown ointment, prepared by rubbing iodine 20 grs., potassium iodide 20 grs., with glycerin 60 grs., and lard 400 grs.

Resolvent, Alterative, and Irritant.

Iodides of Sodium, Arsenic, Iron, Mercury, Potassium, Sulphur, and Lead, and their preparations, are given under the name of each metal.

IPECACUANHÆ RADIX (Ipecacuanha Root)—Cinchonaceæ.

The dried root of Psychotria Ipecacuanha, in small annular, contorted, brown, worm-like pieces. Known also as Hippo.

Dose—$\frac{1}{2}$ to 2 grs. as an Expectorant, and 15 to 30 grs. as an Emetic. For a child 1 year old, as an Expectorant, $\frac{1}{12}$ to $\frac{1}{4}$ gr.; as an Emetic, 2 to 4 grs.

Active principle—Emetine.

Acetum Ipecacuanhæ

Prepared by mixing 1 oz. liquid extract of ipecacuanha, 2 ozs. alcohol (90 per cent.) and diluted acetic acid q.s. to 1 pint.

Dose—10 to 30 minims.

Extractum Ipecacuanhæ Liquidum 2 to $2\frac{1}{4}$ grs. alkaloids in 110 mins.

A dark brown liquid, obtained by macerating and percolating ipecacuanha root with alcohol (90 per cent.), mixing the marc with calcium hydroxide, and exhausting by further percolation. The first portion of percolate is reserved, and the alcohol recovered from the remainder. The resulting extract is dissolved in the reserved portion, and its alkaloidal strength having been tested, it is made to contain 2 to $2\frac{1}{4}$ grs. alkaloids in 110 mins.

Dose—$\frac{1}{2}$ to 2 minims, as an Expectorant; 15 to 20 minims, as an Emetic.

Pilula Ipecacuanhæ cum Scilla 1 in 20. 5 per cent. opium.

Composed of compound powder of ipecacuanha 3 ozs., squill and ammoniacum, of each 1 oz., syrup of glucose q.s., beaten into a mass.

Expectorant, Diaphoretic, Diuretic. Dose—4 to 8 grs.

Pulvis Ipecacuanhæ Compositus 1 in 10. 10 per cent. opium.

(Synonym—Dover's Powder) A fawn-coloured powder, composed of opium ½ oz., ipecacuanha ½ oz., sulphate of potassium 4 ozs.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

Trochiscus Ipecacuanhæ ¼ gr. in each.

Each composed of ipecacuanha root ¼ gr. with fruit basis.

Expectorant.

Trochiscus Morphinæ et Ipecacuanhæ $\frac{1}{36}$ and $\frac{1}{12}$ gr.

Each consists of morphine hydrochloride $\frac{1}{36}$ gr., ipecacuanha root $\frac{1}{12}$ gr., mixed with tolu basis.

Action similar to Dover's Powder.

Vinum Ipecacuanhæ 1 oz. liq. ext. in 1 pint.

A brownish liquid, prepared by mixing 1 oz. liquid extract of ipecacuanha, and 19 ozs. sherry.

Dose—10 to 30 minims as an Expectorant; 4 to 6 drs. as an Emetic. Emetic dose for a child 1 year old, 1 dr.

JABORANDI FOLIA (Jaborandi Leaves)—Rutaceæ.

The dried, shortly-stalked, coriaceous, oblong leaflets of Pilocarpus Jaborandi, from 2½ to 4 inches in length.

Sialagogue, Diuretic, Diaphoretic, and Expectorant.

Pilocarpine (the active principle) is obtained from jaborandi leaves. (See page 265).

Extractum Jaborandi Liquidum 1 in 1.

A liquid extract, prepared by exhausting jaborandi leaves 20 ozs. by percolation with alcohol (45 per cent.), reserving the first 17 ozs. of percolate, and evaporating the remainder to a soft extract which is dissolved in the reserved portion, and making the whole up to 20 ozs. with alcohol (45 per cent.)

Dose—5 to 15 minims.

Tinctura Jaborandi 1 in 5.

Prepared by percolating 4 ozs. jaborandi leaves in No. 40 powder, with alcohol (45 per cent.) to 1 pint.

Dose—½ to 1 dr.

JALAPA (Jalap)—Convolvulaceæ.

The dried tuberous root, in brown, wrinkled, dense, ovoid tubercules, from a pigeon's to a turkey's egg in size, of Ipomœa Purga.

Active principles—Convolvulin and Jalapin.

Drastic Purgative.

Dose—5 to 20 grs. 1 to 2 grs. for a child 1 year old.

Extractum Jalapæ

A dark-brown extract, obtained by evaporating a strong tincture of jalap root, and also by evaporating a cold infusion made from the marc of the tincture, mixing the two extracts thus obtained, and continuing the evaporation.

Dose—2 to 8 grs., in pill.

Pulvis Jalapæ Compositus 1 in 3.

A powder closely resembling Dover's in appearance, composed of jalap 5 ozs., acid potassium tartrate 9 ozs., and ginger 1 oz.

Hydragogue Cathartic. Dose—20 to 60 grs.

Tinctura Jalapæ 1½ per cent. resin.

A deep-brown liquid, prepared by percolating 4 ozs. jalap, in No. 40 powder, with alcohol (70 per cent.), and made to contain 1·5 per cent. resin.

Dose—½ to 1 dr.

In addition to the above, Jalap enters into Pulv. Scammonii Co.

Jalapæ Resina

A dark-brown, shining solid, in opaque brittle fragments, prepared by exhausting jalap with spirit, evaporating and precipitating the resin from the resulting concentrated tincture by adding water, washing, and drying on a water bath.

More powerful than jalap. Dose—2 to 5 grs.

Enters into Pilula Scammonii Co.

JUNIPERI OLEUM (Oil of Juniper)—From Coniferæ.

The colourless or pale yellow oil distilled from the full-grown, unripe green fruit of Juniperus communis.

A Stimulating Diuretic. Dose—½ to 3 minims.

Spiritus Juniperi 1 in 20.

Oil of juniper 1 oz. and alcohol (90 per cent.) to 1 pint.

If not clear shake with powdered talc, and filter.

Dose—20 to 60 minims.

In—Mistura Creosoti.

KAOLINUM (Kaolin)

A soft white powder, obtained by elutriation of native aluminium silicate.

In—Pil. Phosphori.

Emollient in eczema.

KINO (Kino)—From Leguminosæ.

The evaporated juice, in small angular, glistening, dark-red pieces, from incisions in the trunk of Pterocarpus Marsupium.

Astringent (contains about 80 per cent. of tannin).

Dose, in powder—5 to 20 grs. It should not be ordered with iron.

Active ingredients—Kino-tannic Acid and Pyrocatechin.

In addition to the following, Kino enters into Pulv. Catechu Co.

Pulvis Kino Compositus 3 in 4. 5 per cent. opium.

Composed of kino $3\frac{3}{4}$ ozs., opium $\frac{1}{4}$ oz., cinnamon 1 oz.

Astringent, Anodyne, and Narcotic. Dose—5 to 20 grs.

Tinctura Kino 1 in 10.

A reddish-brown liquid, prepared by dissolving kino, powdered, 2 ozs., in glycerin 3 ozs., distilled water 5 ozs., alcohol (90 per cent.) to 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

KRAMERIÆ RADIX (Krameria Root)—Polygalaceæ.

(Synonym—Rhatany Root.)

The dried root of Krameria argentea (Para rhatany) or K. triandra (Peruvian rhatany), in long cylindrical pieces, purplish-brown or reddish-brown in colour.

Astringent and Tonic. (Contains much tannin.)

In addition to the following, Krameria enters into Pulv. Catechu Co.

Extractum Krameriæ

(Synonym—Extract of Rhatany).

A deep reddish-brown, *solid* extract, obtained by exhausting krameria root with water, and evaporating the liquid to *dryness*.

Dose—5 to 15 grs., in pill, or rubbed up with chalk mixture.

Infusum Krameriæ 1 in 20 ($\frac{1}{4}$ hour).

(Synonym—Infusion of Rhatany).

Krameria root 1 oz. infused in boiling water 20 ozs.

Dose—$\frac{1}{2}$ to 1 oz.

Liquor Krameriæ Concentratus 1 in 2.

Obtained by percolating 10 ozs. krameria root with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

Tinctura Krameriæ 1 in 5.

(Synonym—Tincture of Rhatany).

A deep-red liquid, prepared by percolating krameria root in No. 40 powder 4 ozs., with alcohol (60 per cent.) q.s. to make 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

Trochiscus Krameriæ 1 gr. in each.

(Synonym—Rhatany Lozenge.)

Prepared with extract of krameria and fruit basis.

Trochiscus Krameriæ et Cocainæ 1 gr. and $\frac{1}{20}$ gr. in each.

(Synonym—Rhatany and Cocaine Lozenge.)

Prepared with extract of krameria, cocaine hydrochloride, and fruit basis.

LAUROCERASI FOLIA (Cherry-Laurel Leaves)—Rosaceæ.

The elliptical, smooth, shining, thick, deep-green, *fresh* leaves of Prunus Laurocerasus—the common or cherry laurel.

Aqua Laurocerasi 1 lb. to 1 pint. (·1 per cent. HCN.)

A colourless liquid, prepared by distilling 1 pint from 1 lb. fresh cherry-laurel leaves and $2\frac{1}{2}$ pints water, and making its strength correspond to ·1 per cent. real hydrocyanic acid.

Sedative. Dose—$\frac{1}{2}$ to 2 drs.

LAVANDULÆ OLEUM (Oil of Lavender)—Labiatæ.

The almost colourless oil distilled from the flowers of Lavandula vera.

Carminative and Antispasmodic. Dose—$\frac{1}{2}$ to 3 mins.

In—Linim. Camph. Ammon.

Spiritus Lavandulæ 1 in 10.

Oil of lavender 1 oz. and alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins.

Tinctura Lavandulæ Composita 45 minims to 1 pint.

A bright crimson liquid, prepared by macerating cinnamon and nutmeg, of each 75 grs., and red sanders wood 150 grs., in alcohol (90 per cent.) 1 pint, filtering, and adding oil of lavender 45 mins. and oil of rosemary 5 mins.

Dose—$\frac{1}{2}$ to 1 dr.

Used to colour Liquor Arsenicalis.

LIMONIS CORTEX (Lemon Peel)—Aurantiaceæ.

The *fresh* outer part of the pericarp of the fruit of Citrus medica var. B Limonum.

Aromatic; chiefly used for its flavour.

It enters into Inf. Aurant. Co. and Inf. Gent. Co. and the following:—

Oleum Limonis

The pale yellow, fragrant *volatile* oil, obtained from fresh lemon peel.

Dose—$\frac{1}{2}$ to 3 minims, but chiefly used for flavouring.

In—Lin. Pot. Iod. cum Sapone, Spt. Ammon. Aromat., Tinct. Guaiaci Ammon., and Tinct. Valer. Ammon.

Succus Limonis 30 to 40 grs. citric acid in 1 oz.

The freshly expressed juice of the ripe fruit of Citrus medica var. B Limonum. A slightly turbid yellowish liquid.

Refrigerant and Antiscorbutic. Dose—½ to 2 ozs.

110 mins. of lemon juice are neutralised by about 11½ grs. $KHCO_3$, or about 9½ grs. $NaHCO_3$, or about 16½ grs. Na_2CO_3.

Syrupus Limonis 1 of juice in 2.

A yellowish syrup, prepared by dissolving 38 ozs. sugar in 25 ozs. lemon juice which has been clarified by subsidence, and when cold adding 2 ozs. of a tincture of lemon peel, which has been made by macerating 1 oz. fresh lemon peel in 1½ ozs. alcohol (90 per cent.) for 7 days, and, after pressing and filtering, making up to 2 ozs. with the alcohol.

Dose—½ to 1 dr.

Tinctura Limonis 1 in 4.

A sherry-coloured liquid, prepared by macerating fresh lemon peel 5 ozs. in 1 pint alcohol (90 per cent.).

Dose—½ to 1 dr.

LINUM (Linseed)—Linaceæ.

The small, shining, oval, brown, pointed seeds of Linum usitatissimum—common flax.

Demulcent, Emollient, and Nutrient.

Linum Contusum (Crushed Linseed).

Linseed reduced to coarse powder; it should be recently prepared, and contain not less than 30 per cent. of oil.

Used for making poultices.

Oleum Lini (Linseed Oil).

The viscid yellow oil expressed without heat from linseed.

Only used externally as an Emollient.

LITHII CARBONAS (Lithium Carbonate) Li_2CO_3

In a white powder, or in minute crystalline grains, obtained from native silicates of lithium.

Diuretic and Antacid. Dose—2 to 5 grs.

Lithii Citras (Lithium Citrate) $C_3H_4OH,(COOLi)_3 4H_2O$

A white crystalline deliquescent salt, prepared by saturating citric acid with lithium carbonate. Acts like the carbonate.

Dose—5 to 10 grs. in solution, freely diluted.

Lithii Citras Effervescens (Effervescent Lithium Citrate). 1 in 20.

A white granular powder, prepared by mixing lithium citrate 5 ozs., citric acid 21 ozs., tartaric acid 31 ozs., and sodium bicar-

bonate 58 ozs., all in powder, heating to between 200° and 220°F, and stirring to cause granulation. The product should weigh 100 ozs.

Dose—60 to 120 grs.

LOBELIA (Lobelia)—Lobeliaceæ.

The dried flowering herb of Lobelia inflata (Indian Tobacco), in compressed rectangular parcels of angular stems, alternate toothed hairy leaves and inflated fruits.

Active principle, extracted with difficulty—Lobeline, a non-volatile alkaloid.

Tinctura Lobeliæ Ætherea 1 in 5.

A green liquid, prepared by percolating lobelia 4 ozs., in coarse powder, with spirit of ether to produce 1 pint.

Dose—5 to 15 minims.

LUPULUS (Hops)—Cannabinaceæ.

(Synonym—Humulus).

The dried, greenish-yellow strobiles of Humulus Lupulus, from cultivated plants.

A Bitter Tonic and feeble Narcotic.

Lupulinum (Lupulin).

A granular, brownish-yellow glandular powder, obtained from the dried strobiles of Humulus Lupulus.

Tonic, Anodyne, and Hypnotic. Dose—2 to 5 grs.

Infusum Lupuli 1 in 20 ($\frac{1}{4}$ hour).

Prepared by infusing hops 1 oz. in boiling water 1 pint.

Dose—1 to 2 ozs.

Tinctura Lupuli 1 in 5.

A red liquid, prepared by macerating hops 4 ozs. with alcohol (60 per cent.) 1 pint. Dose—$\frac{1}{2}$ to 1 dr.

MAGNESIA PONDEROSA (Heavy Magnesia) MgO

(Synonyms—Heavy Calcined Magnesia ; Heavy Magnesium Oxide).

A white insoluble powder, prepared by exposing heavy magnesium carbonate to a dull red heat.

Antacid, Laxative, and Antilithic.

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs. May be used in Pulvis Rhei Co.

Magnesia Levis (Light Magnesia) MgO

(Synonyms—Light Calcined Magnesia ; Light Magnesium Oxide).

A bulky, white, insoluble powder, identical with the preceding, only lighter, bulk for bulk, in the ratio of $3\frac{1}{2}$ to 1. Prepared by calcining light magnesium carbonate.

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs. In—Pulvis Rhei Compositus.

Magnesii Carbonas Ponderosus $(MgCO_3)_8,Mg(HO)_24H_2O$

(Heavy magnesium carbonate).

A white granular powder, prepared by mixing *strong* hot solutions of magnesium sulphate and sodium carbonate, washing and drying the precipitate by a heat not exceeding 212°.

Antacid and Purgative.

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs.

In—Liq. Magnes. Carb. and Troch. Bismuthi.

Magnesii Carbonas Levis $(MgCO_3)_8,Mg(HO)_24H_2O$

(Light magnesium carbonate).

A very light, partially amorphous powder, prepared by mixing *weak* cold solutions of magnesium sulphate and sodium carbonate, boiling, washing the precipitate, and drying by a heat not exceeding 212°.

Dose—5 to 30 grs. for repeated administration ; single dose—30 to 60 grs.

Liquor Magnesii Carbonatis 10 grs. in 1 oz.

(Synonym—Fluid Magnesia).

A colourless liquid, prepared by mixing together a solution of magnesium sulphate 2 ozs. in water 10 ozs., heated to boiling point, and a solution of sodium carbonate $2\frac{1}{2}$ ozs. in water 10 ozs., boiling, washing carefully the precipitated magnesium carbonate, mixing it with distilled water 1 pint, and passing pure carbonic acid gas, at three atmospheres pressure, through it till dissolved.

Antacid. Dose—1 to 2 ozs. ; $\frac{1}{2}$ dr. for a child 1 year old.

Magnesii Sulphas $MgSO_4,7H_2O$

(Synonym—Epsom Salt).

In minute, colourless, rhombic prisms, prepared by the interaction of native magnesium carbonates and diluted sulphuric acid ; or by purifying the native sulphate. 3 ozs. dissolve in 4 ozs. water.

Hydragogue Purgative.

Dose—30 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

In addition to the following, it enters into Mist. Sennæ Co., 1 in $5\frac{1}{2}$.

Magnesii Sulphas Effervescens 1 in 2.

(Synonym—Effervescent Epsom Salt).

Prepared by drying 50 ozs. magnesium sulphate, and mixing it with 36 ozs. sodium bicarbonate, 19 ozs. tartaric acid, 12½ ozs. citric acid, and 10½ ozs. sugar, all in powder, heating between 200° and 220°F., and stirring assiduously till the powder becomes granulated. The product should weigh 100 ozs.

Cathartic and Antacid. Dose—60 to 240 grs. for repeated administration ; ½ to 1 oz. for single dose.

MEL DEPURATUM (Clarified Honey).

Honey strained, whilst hot, through wetted flannel.

Enters into Confection of Pepper, and

Mel Boracis (Borax Honey). 1 in 9½.

Prepared by rubbing borax 1 oz. with clarified honey 8 ozs., and glycerin ½ oz.

Alterative to diseased mucous surfaces.

Oxymel (Oxymel) 4 in 5.

A thick syrupy liquid, composed of clarified honey (liquefied) 40 ozs., acetic acid 5 ozs., water about 5 ozs. S.G. 1·32.

Expectorant, but chiefly used as a vehicle. Dose—1 to 2 drs.

Oxymel Scillæ (Oxymel of Squill).

Prepared by macerating 2½ ozs. squill in 2½ ozs. acetic acid, and 8 ozs. water ; mixing the filtrate (10 ozs.) with 27 fl. ozs. liquefied clarified honey, or q.s. to produce S.G. 1·32.

Expectorant. Dose—½ to 1 dr.

MENTHÆ PIPERITÆ OLEUM (Oil of Peppermint).

The colourless or pale yellow oil distilled from the fresh flowering herb of Mentha piperita.—(Labiatæ).

Antispasmodic and Carminative. Dose—½ to 3 minims.

It enters into Pil. Rhei Co., Tr. Chlorof et Morph. Co., and

Aqua Menthæ Piperitæ 1 in 1,000.

A colourless liquid, prepared by mixing oil of peppermint 77 mins. with water 1½ gallons, and distilling 1 gallon.

Dose—1 to 2 ozs. ; 1 dr. for a child 1 year old.

Spiritus Menthæ Piperitæ 1 in 10.

Oil of peppermint 1 oz. and alcohol (90 per cent.) to 10 ozs.

Dose—5 to 20 mins.

☞ This is half the strength of the Essence P.B. '85.

MENTHÆ VIRIDIS OLEUM (Oil of Spearmint).

The colourless or pale-yellow oil distilled from the fresh flowering herb of Mentha viridis.—(Labiatæ).

Action and dose similar to peppermint.

Aqua Menthæ Viridis 1 in 1,000

A colourless liquid, obtained by mixing oil of spearmint 77 minims and water $1\frac{1}{2}$ gallons, and distilling 1 gallon.

Dose—1 to 2 ozs.; 1 dr. for a child 1 year old.

MENTHOL (Menthol) C_6H_9,OH,CH_3,C_3H_7

A stearoptene in colourless crystals, or in fused crystalline masses, obtained by cooling the oil distilled from the fresh herb of Mentha arvensis, vars. piperascens et glabrata; and of M. piperita.

Antiseptic and Antineuralgic.

Dose—$\frac{1}{2}$ to 2 grs., in pill; or rubbed on the skin as a local Anæsthetic. Sometimes called Peppermint Camphor.

Emplastrum Menthol 1 in $6\frac{2}{3}$

Prepared by melting together 1 oz. yellow beeswax and $7\frac{1}{2}$ ozs. resin, and stirring in $1\frac{1}{2}$ ozs. menthol.

Local Anodyne.

MEZEREI CORTEX (Mezereon Bark)—Thymelaceæ.

The dried bark, in tough brown strips or quilled pieces of various lengths, of Daphne Mezereum, of D. Laureola, or of D. Gnidium.

Vesicant and Alterative.

Seldom used internally.

Enters into Liq. Sarsæ Co. Conc. 1 in 20.

MORPHINÆ ACETAS (Morphine Acetate)
$C_{17}H_{19}NO_3C_2H_4O_2,3H_2O$.

A white soluble powder, prepared by neutralising morphine with acetic acid.

Anodyne and Narcotic. Dose—$\frac{1}{8}$ to $\frac{1}{2}$ gr.

Liquor Morphinæ Acetatis 1 gr. in 110 mins.

An almost colourless liquid, prepared by dissolving morphine acetate $17\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz., and diluted acetic acid 38 mins., and making up to 4 ozs. with water.

Dose—10 to 60 minims.

Morphinæ Hydrochloridum (Morphine Hydrochloride)—Hydrochlorate of Morphine, B.P., 1885.
$C_{17}H_{19}NO_3,HCl,3H_2O$.

The hydrochloride of an alkaloid, in white, fine, silky prisms, obtained from opium.

Action, dose, and strength similar to morphine acetate.

Liquor Morphinæ Hydrochloridi 1 gr. in 110 mins.

A colourless liquid, prepared by dissolving morphine hydrochloride $17\frac{1}{2}$ grs. in distilled water and alcohol (90 per

cent.), of each 1 oz., and diluted hydrochloric acid 38 mins., and adding water q.s. to make 4 ozs.

Dose—10 to 60 minims.

Suppositoria Morphinæ $\frac{1}{4}$ gr. in each.

Composed of morphine hydrochloride 3 grs., and oil of theobroma 177 grs., in 12 conical suppositories.

Trochiscus Morphinæ $\frac{1}{36}$ gr. in each.

White lozenges, composed of morphine hydrochloride $\frac{1}{36}$ gr., with tolu basis.

Trochiscus Morphinæ et Ipecacuanhæ $\frac{1}{36}$ and $\frac{1}{12}$ gr.

White lozenges, each composed of morphine hydrochloride $\frac{1}{36}$ gr. and ipecacuanha root $\frac{1}{12}$ gr., with tolu basis.

Tinctura Chloroformi et Morphinæ Composita (See page 220).

Morphinæ Tartras (Morphine Tartrate) $(C_{17}H_{19}NO_3)_2,C_4H_6O_6,3H_2O$

A white crystalline powder, obtained by combining morphine and tartaric acid in molecular proportions.

Dose—$\frac{1}{8}$ to $\frac{1}{2}$ gr. Acts like the hydrochloride and acetate.

Injectio Morphinæ Hypodermica 5 grs. in 110 mins.

Made by dissolving morphine tartrate 50 grs. in water which has been boiled and cooled, to produce 1,100 minims.

Dose, by subcutaneous injection—2 to 5 minims.

Liquor Morphinæ Tartratis 1 gr. in 110 mins.

A colourless liquid, prepared by dissolving morphine tartrate $17\frac{1}{2}$ grs. in distilled water and alcohol (90 per cent.), of each 1 oz., and making up to 4 ozs. with distilled water.

Action and dose same as hydrochloride and acetate solutions.

MORRHUÆ OLEUM (Cod-Liver Oil).

The pale-yellow oil extracted from the fresh liver of the cod—Gadus Morrhua—by a heat not exceeding 180°, and from which solid fat has been separated by filtration at about 23°F.

A Nutritive Tonic. Dose—1 to 4 drs., in emulsion, or in milk.

MOSCHUS (Musk).

The dried secretion from the preputial follicles of Moschus moschiferus, in small, irregular, reddish-black grains.

Stimulant and Antispasmodic. Dose—5 to 10 grs.

MYRISTICA (Nutmeg)—Myristicaceæ.

The oval, furrowed, dried seed of Myristica fragrans divested of its testa; the transverse section has a marbled appearance.

Carminative and Narcotic.

In addition to the following, Nutmeg enters into the composition of Pulv. Catechu Co., Pulv. Cretæ Arom., Spt. Armoraciæ Co., and Tinct. Lavand. Co.

Oleum Myristicæ (Oil of Nutmeg).

The pale-yellow oil distilled from nutmeg.

Dose—½ to 3 minims, on sugar.

Enters into Pil. Aloes Socot., Spt. Ammon. Aromat., Tinct. Guaiaci Ammon., and Tr. Valer. Ammon.

Spiritus Myristicæ 1 in 10.

Oil of nutmeg 1 oz. and alcohol (90 per cent.) to 10 ozs. If not clear shake with talc, and filter.

Dose—5 to 20 mins.

Enters into Mist. Ferri Comp.

MYRRHA (Myrrh)—Amyridaceæ.

A gum-resinous exudation, in irregular brownish-yellow or red tears or masses, from the stem of Balsamodendron Myrrha, and probably other species.

Emmenagogue and Expectorant. It increases phagocytosis.

Enters into Dec. Aloes Co., Mist. Ferri Co., Pil. Aloes et Myrrhæ, Pil. Galbani Co., and Pil. Rhei Co.

Tinctura Myrrhæ 1 in 5.

A pale-brown liquid, prepared by macerating myrrh 4 ozs. with alcohol (90 per cent.) to 1 pint.

Dose—½ to 1 dr., in sherry, or in emulsion.

NAPHTHOL (Beta-naphthol) $C_{10}H_7OH$

Beta-naphthol or beta-mono-hydroxy-naphthalene, occurring as a sparingly soluble, white crystalline solid, is usually prepared from naphthalene-sulphonic acid.

Intestinal Disinfectant and Stimulating Application in scaly skin affections.

Dose—3 to 10 grs.

NUX VOMICA (Nux Vomica)—Loganiaceæ.

The dried, ripe, circular, button-shaped seeds, about 1 inch in diameter, covered with short, satiny hairs, of Strychnos Nux-vomica.

Tonic, and Stimulant to the Spinal Cord.

Active principles—Strychnine and Brucine.

Dose—1 to 4 grs., in powder.

Extractum Nucis Vomicæ Liquidum 1½ grs. Strychnine in 110 mins.

A brown liquid, obtained by exhausting powdered nux vomica by percolation with alcohol (70 per cent.). The first portion of percolate is reserved, and in this the soft extract obtained by

evaporating the remainder is dissolved. The percentage of strychnine in the solution is estimated, and enough alcohol (70 per cent.) is added to make the resulting liquid extract contain 1½ gr. of the alkaloid—Strychnine—in 110 mins.

Dose—1 to 3 minims.

Extractum Nucis Vomicæ 5 per cent. Strychnine.

A brown extract, prepared by evaporating 10 ozs. of the liquid extract to 3 ozs., an estimated amount of milk sugar having been previously added so as to make the firm extract contain 5 per cent. of the alkaloid.

Dose—¼ to 1 gr.

Tinctura Nucis Vomicæ ¼ gr. Strychnine in 110 mins.

A sherry-coloured liquid, prepared by mixing 2 ozs. liquid extract of nux vomica, 3 ozs. water, and alcohol (90 per cent.) q.s. to make 12 ozs. It contains about ⅛ gr. Strychnine in 1 dr.

Dose—5 to 15 minims.

OLIVÆ OLEUM (Olive Oil)—Oleaceæ.

The yellow oil expressed from the ripe fruit of Olea europæa.

Dose—2 drs. to 1 oz. as a Laxative.

In—4 plasters, 4 ointments, and 3 liniments.

OPIUM (Opium)—Papaveraceæ.

The juice inspissated by spontaneous evaporation obtained by incision, from the unripe capsules of the poppy, Papaver somniferum, in irregular lumps of from ½ to 2 lbs; when fresh, tearing with an irregular, moist, brown surface; 100 grs. of the dry powder should yield about 10 grs. anhydrous morphine; but any opium is officially permitted as a source of alkaloids, and of tincture and extract of opium which are standardised.

Active principles—Morphine and Codeine. Contains 16 other alkaloids. Anodyne and Narcotic. Dose—½ to 2 grs.

Pulvis Opii Opium in powder (of a rich brown colour).

☞ Although it is not recognised under a separate heading, it is inserted here to remind the student that opium cannot be powdered until it is first thoroughly dried, and that in drying it loses water, and in grinding there is a further loss of inert woody fibrous impurities, and the powder is stronger than the fresh opium by about ⅛, 7 grains being equal to 8 of opium.

Emplastrum Opii 1 in 10.

A hard brown solid, prepared by heating resin plaster 9 ozs., and adding, by degrees, powdered opium 1 oz.

Extractum Opii 1 from 2. (20 per cent. Morphine.)

A dark-brown, tough extract, prepared by evaporating a cold infusion of 1 lb. opium, till the product weighs ½ lb.

Dose—¼ to 1 gr. It is much stronger than powdered opium, and is said to be less stimulating.

Extractum Opii Liquidum ¾ gr. morphine in 110 mins.

A dark-brown liquid, consisting of extract of opium ¾ oz., dissolved in distilled water 16 ozs., and alcohol (90 per cent.) 4 ozs.

Dose—5 to 30 mins.

☞ Though considerably weaker, this is regarded as the representative of Battley's Sedative Liquor.

Linimentum Opii 1 in 2.

An almost black liquid, consisting of equal parts laudanum and soap liniment.

Pilula Ipecacuanhæ cum Scilla 1 in 20, or 5 per cent. opium.

A brown mass, composed of Dover's powder 3 ozs., squill 1 oz., ammoniacum 1 oz., syrup of glucose q.s., beaten together.

Narcotic and Expectorant. Dose—4 to 8 grs.

Pilula Plumbi cum Opio 1 in 8, or 12½ per cent. opium.

A brownish-black mass, composed of acetate of lead 36 grs., opium in powder 6 grs., and syrup of glucose 4 grs.

Astringent as well as Narcotic. (Should be made fresh.)

Dose—2 to 4 grs.

Pilula Saponis Composita 1 in 5, or 20 per cent. opium.

A light-brown mass, composed of opium in powder ½ oz., hard soap 1½ ozs., syrup of glucose ½ oz. beaten together.

Dose—2 to 4 grs.

Pulvis Cretæ Aromaticus cum Opio 1 in 40, or 2½ per cent. opium.

A pale-brown powder, composed of opium ¼ oz., aromatic chalk powder 9¾ ozs.

Carminative and Anodyne; well adapted for children.

Dose—10 to 40 grs.; for a child 1 year old, ½ to 1 gr.

Pulvis Ipecacuanhæ Compositus 1 in 10. 10 per cent. opium.

(Synonym—Dover's Powder).

A fawn-coloured powder, composed of ipecacuanha and opium of each ½ oz., sulphate of potassium 4 ozs.

Diaphoretic and Anodyne. Dose—5 to 15 grs.

In—Pilula Ipecacuanhæ cum Scilla.

Pulvis Kino Compositus 1 in 20. 5 per cent. opium.

A dark-red powder, composed of kino 3¾ ozs., opium ¼ oz., cinnamon 1 oz.

Astringent and Narcotic. Dose—5 to 20 grs.

Pulvis Opii Compositus 1 in 10. 10 per cent.

A brown powder, composed of opium 1½ ozs., black pepper 2 ozs., ginger 5 ozs., caraway 6 ozs., tragacanth ½ oz.

Carminative and Narcotic. Dose—2 to 10 grs.

Suppositoria Plumbi Composita 1 gr. of opium in each.

Composed of acetate of lead 3 grs., opium 1 gr., oil of theobroma 11 grs. in each.

Tinctura Camphoræ Composita $\frac{1}{4}$ gr. opium in 1 dr.

(Synonyms—Paregoric ; Paregoric Elixir).

A sherry-coloured liquid, composed of tincture of opium 585 mins., benzoic acid 40 grs., camphor 30 grs., oil of anise 30 minims, alcohol (60 per cent.) q.s. to make 1 pint.

Anodyne, Expectorant, and Stimulant.

Dose—$\frac{1}{2}$ to 1 dr. ; for a child 1 year old, 4 minims. This is the only safe liquid preparation of opium for infants.

Tinctura Opii ·75 per cent. morphine, or 1 gr. opium in 15 mins.

(Synonym—Laudanum).

A dark reddish-brown liquid, prepared by infusing 3 ozs. opium in 10 ozs. water at 200°F. for 6 hours, adding 10 ozs. alcohol (90 per cent.), macerating for 24 hours, straining, and filtering after 24 hours. The percentage of morphine is calculated, and alcohol (90 per cent.) and water in equal parts are added to make the tincture contain ·75 per cent.

Narcotic and Anodyne. Dose—5 to 15 mins. for repeated administration ; 20 to 30 mins. for single dose.

In—Linimentum Opii, Tinct. Camph. Co., and

Tinctura Opii Ammoniata About $\frac{3}{5}$ gr. opium in 1 dr.

A dark-brown liquid, prepared by mixing tincture of opium 3 ozs., benzoic acid 180 grs., oil of anise 1 dr., solution of ammonia 4 ozs., and alcohol (90 per cent.) to 1 pint. Commonly known as Scotch Paregoric.

Anodyne and Expectorant. Dose—$\frac{1}{2}$ to 1 dr., freely diluted.

Unguentum Gallæ cum Opio $7\frac{1}{2}$ per cent. opium.

A brown ointment, prepared by rubbing up powdered opium 75 grs., with ointment of galls 925 grs.

A soothing Anodyne to painful hæmorrhoids.

The following preparations contain Opium, but under another name :—

Pilula Ipecacuanhæ cum Scilla ; Pilula Plumbi cum Opio ; Pilula Saponis Co. ; Pulvis Cretæ Aromat. cum Opio ; Pulvis Ipecacuanhæ Co. ; Pulvis Kino Co. ; Suppositoria Plumbi Composita Tinct. Camphoræ Co. ; Ungt. Gallæ cum Opio.

OXYMEL and OXYMEL SCILLÆ (See under Mel and Scilla).

PANCREATIS LIQUOR (Pancreatic Solution).

A liquid, containing the digestive principles of the fresh pancreas of the pig; obtained by digesting in 20 ozs. of alcohol (20 per cent.) for 7 days 5 ozs. pancreas which has been freed from fat, and finely divided by aid of fine sand or powdered pumice stone. The preparation is most active when the animal has been fed shortly before being killed.

Used as a peptonising agent.

PAPAVERIS CAPSULÆ (Poppy Capsules)—Papaveraceæ.

The large, globular, crowned, dried, nearly ripe fruits of the white poppy, Papaver somniferum.

Anodyne and Narcotic, resembling opium.

PARAFFINUM DURUM (Hard Paraffin).

A colourless, translucent, waxy-looking substance, melting between 130° and 135°F., being a mixture of several of the harder members of the paraffin series of hydrocarbons; obtained by distillation from shale, and purified after separation of the liquid oils by refrigeration.

Used as a basis for ointments, into 3 of which it enters.

PARAFFINUM LIQUIDUM (Liquid Paraffin).

A clear, colourless, odourless, non-fluorescent, oily liquid obtained from petroleum, after the more volatile portions have been removed by distillation.

Alterative and Sedative to inflamed mucous membranes.

PARAFFINUM MOLLE (Soft Paraffin).

A white or yellow, translucent, semi-solid mixture, containing soft members of the paraffin series of hydrocarbons; usually obtained by purifying the less volatile portions of petroleum. It is commonly known as Vaseline.

Emollient and Protective. Enters into 6 ointments.

Unguentum Paraffinum (Paraffin Ointment).

Obtained by melting together hard paraffin 3 ozs. and soft paraffin (white or yellow) 7 ozs.

Used as a basis for 11 ointments.

PARALDEHYDUM (Paraldehyde) $C_6H_{12}O_3$

A colourless liquid with a disagreeable ethereal odour and burning taste, being the product of the polymerisation of aldehyde by various acids and salts.

A true Hypnotic. Dose—$\frac{1}{2}$ to 2 drs.

PAREIRÆ RADIX (Pareira Root)—Menispermaceæ.

The dried root of Chondrodendron tomentosum, in long, nearly cylindrical pieces, more or less twisted, from $\frac{3}{4}$ to 3 inches

thick, showing on cross section medullary rays and concentric rings.

Active principle—Pelosine or Buxine.

Diuretic, and Anodyne to the mucous lining of the bladder.

Extractum Pareiræ Liquidum 25 per cent. of extractives.

A black liquid, prepared by exhausting, by maceration and percolation, pareira root with *boiling* water, evaporating till it contains $\frac{1}{3}$ of its weight of extractive matter, and adding alcohol (90 per cent.) so as to produce from 3 volumes of the evaporated liquid 4 volumes of liquid extract.

Dose—$\frac{1}{2}$ to 2 drs.

PEPSINUM (Pepsin).

A light, yellowish-brown enzyme, obtained from the mucous membrane of the fresh and healthy stomach of the pig, sheep, or calf. Should dissolve 2,500 times its weight of hard boiled white of egg.

Digestive. Dose—5 to 10 grs.

Glycerinum Pepsini (Glycerin of Pepsin). 5 grs. in 1 dr.

A clear liquid, obtained by macerating for a week, pepsin 800 grs., in a mixture of hydrochloric acid 110 mins., glycerin 12 ozs., and water 6 ozs., filtering, and adding water to produce 1 pint.

Dose—1 to 2 drs.

PHENACETINUM (Phenacetin) $C_2H_5O,C_6H_4,NHCOCH_3$

(Para-acet-phenetidin).

Colourless, tasteless, inodorous scaly crystals, produced by the action of glacial acetic acid on para-phenetidin, a body obtained from para-nitro-phenol.

Antipyretic and Analgesic. Dose—5 to 10 grs.

PHENAZONUM (Phenazone).

(Phenyl-dimethyl-iso-pyrazolone) $C_6H_5(CH_3)_2C_3HN_2O$

Colourless, inodorous, bitter scaly crystals, very soluble in water; obtainable from phenyl-hydrazine by interaction with aceto-acetic ether, and the subsequent interaction of the resulting phenyl-methyl-iso-pyrazolone with methyl iodide. Commonly known as Antipyrine.

Antipyretic and Analgesic. Dose—5 to 20 grs.

PHOSPHORUS (Phosphorus) P

A semi-transparent, wax-like, solid, non-metallic element, obtained from calcium phosphate.

Tonic and Restorative.

Dose, in pill or solution—$\frac{1}{100}$ to $\frac{1}{20}$ gr.

Used in preparing Concentrated Phosphoric Acid.

Oleum Phosphoratum 1 per cent.

A clear, straw-coloured oil, phosphorescent in the dark, prepared by heating almond oil to 300°, filtering when cold, and dissolving 1 part by weight of dry phosphorus in 99 parts by weight of the oil, at a temperature of 180°.

Dose—1 to 5 minims—*i.e.*, $\frac{1}{100}$ to $\frac{1}{20}$ gr. of phosphorus.

Pilula Phosphori 1 in 50.

Prepared by dissolving 10 grs. phosphorus in 33 mins. bisulphide of carbon, and carefully mixing with a melted mixture of 125 grs. each white beeswax and lard, cooled to the consistence of cream, adding 115 grs. kaolin and mixing till thoroughly incorporated. The mass should be kept immersed in cold water in a dark place, and 1 gr. gum acacia added to every 3 grs. of mass immediately before dispensing.

Dose—1 to 2 grs.—*i.e.*, $\frac{1}{50}$ to $\frac{1}{25}$ gr. of phosphorus.

PHYSOSTIGMATIS SEMINA (Calabar Bean)—Leguminosæ.

The large kidney-shaped, brown, dried, ripe seed, with a furrow along its convex margin, of Physostigma venenosum.

Active principle—Physostigmine or Eserine.

Local Myotic.

Extractum Physostigmatis

A dark-brown firm extract, prepared by evaporating a strong tincture of Calabar bean made with alcohol (90 per cent.) to the consistence of a very soft extract, and mixing with 3 times its weight of milk sugar.

Dose—$\frac{1}{4}$ to 1 gr., in pill.

Physostigminæ Sulphas (Physostigmine Sulphate) $(C_{15}H_{21}N_3O_2)_2,H_2SO_4,xH_2O$

(Synonym—Eserine Sulphate).

The sulphate of an alkaloid, in pinkish or colourless crystals, obtained from Calabar bean.

A Myotic or pupil contractor. Dose—$\frac{1}{60}$ to $\frac{1}{20}$ gr.

Lamellæ Physostigminæ (Discs of Physostigmine).

Discs of gelatin, with some glycerin, each weighing about $\frac{1}{50}$ gr., and containing $\frac{1}{1000}$ gr. physostigmine sulphate.

Used to cause contraction of the pupil.

PICROTOXINUM (Picrotoxin)—Menispermaceæ.

A neutral principle in colourless, inodorous, prismatic, bitter crystals, obtained from the seeds of Anamirta paniculata.

Anhidrotic. Dose—$\frac{1}{100}$ to $\frac{1}{25}$ gr.

PILOCARPINÆ NITRAS (Pilocarpine Nitrate)
$C_{11}H_{16}N_2O_2,HNO_3$
The nitrate of an alkaloid, obtained from jaborandi leaves. In minute acicular crystals, or as a white powder.
Diaphoretic, Sialagogue, Expectorant. Dose—$\frac{1}{20}$ to $\frac{1}{2}$ gr.

PIMENTA (Pimento)—Myrtaceæ.
The small, round, rough, brown, dried, full-grown, unripe berries of the allspice tree—Pimenta officinalis.
Stimulant and Carminative.

Aqua Pimentæ 8 ozs. to 1 gallon.
A brownish unstable preparation, obtained by mixing pimento 8 ozs. with water 2 gallons, and distilling off 1 gallon.
Carminative. Dose—1 to 2 ozs.

Oleum Pimentæ
An oil (yellowish or yellowish-red when prepared, but soon becoming darker) distilled from pimento or allspice. *It sinks in water.*
Dose—$\frac{1}{2}$ to 3 minims, in pill, or in sugar, or in an emulsion.

PINI OLEUM (Oil of Pine)—Coniferæ.
The nearly colourless oil, with aromatic odour, distilled from the fresh leaves of Pinus Pumilio.
Rubefacient and Astringent like turpentine.

PIPER NIGRUM (Black Pepper)—Piperaceæ.
The small, round, wrinkled, brownish-black, dried, unripe fruit of Piper nigrum.
Carminative and Diuretic.
It enters into Pulv. Opii Co., and the following :—

Confectio Piperis 1 in 10.
An almost black paste, prepared by mixing black pepper 2 ozs., caraway fruit 3 ozs., with clarified honey 15 ozs. Resembles and is sometimes called Ward's paste, and is in repute as an internal remedy for hæmorrhoids.
Dose—60 to 120 grs.

PIX BURGUNDICA (Burgundy Pitch)—From Coniferæ.
A hard, brittle, yellow solid, being a resinous exudation from the stem of Picea excelsa, melted and strained. Seldom used except to impart solidity and rubefacient qualities to plasters.

Emplastrum Picis (Pitch Plaster) 1 in 2.
A yellow solid, composed of Burgundy pitch 26 ozs., frankincense 13 ozs., resin and yellow beeswax of each $4\frac{1}{2}$ ozs., olive oil and water of each 2 ozs., melted, and evaporated with constant stirring.
A Rubefacient and Stimulating Plaster.

PIX CARBONIS PRÆPARATA (Prepared Coal Tar).

Obtained by placing commercial coal tar in a shallow vessel, and maintaining it at a temperature of 120°F. for one hour, stirring frequently.

A Stimulating Application.

Liquor Picis Carbonis (Solution of Coal Tar) 1 in 6.

A dark brown transparent liquid, made by digesting at 120°F. for 2 days 4 ozs. prepared coal tar in 1 pint of a tincture of quillaia, obtained by percolating 2 ozs. quillaia bark with alcohol (90 per cent.) to make 1 pint.

PIX LIQUIDA (Tar)—From Coniferæ.

A blackish, viscid, bituminous liquid, obtained by destructive distillation from the wood of Pinus sylvestris and other pines. Known as Stockholm Tar.

Expectorant. A Stimulating Application (when diluted with wax, &c.) to chronic scaly skin affections.

Unguentum Picis Liquidæ 5 in 7.

A black ointment, prepared by melting yellow beeswax 2 ozs., and adding tar 5 ozs., and stirring whilst the mixture cools.

PLUMBI ACETAS (Lead Acetate) $Pb(C_2H_3O_2)_2,3H_2O$

In white, crystalline, slightly efflorescent masses, obtained by dissolving lead oxide or lead carbonate in acetic acid. Known as "Sugar of lead."

Sedative and Astringent. Used in internal hæmorrhages.

Dose—1 to 5 grs., in solution or in pill.

As this salt forms insoluble precipitates, it should not be ordered with iodides, sulphates, or tannates.

Glycerinum Plumbi Subacetatis (Glycerin of Lead Subacetate) 1 in 6 by weight.

Prepared by boiling, filtering, and evaporating to $32\frac{3}{4}$ ozs. by weight, 5 ozs. lead acetate, $3\frac{1}{2}$ ozs. lead oxide, 20 ozs. glycerin, and 12 ozs. water.

Astringent and Local Sedative.

Unguentum Glycerini Plumbi Subacetatis

See table on page 268.

Pilula Plumbi cum Opio 3 of lead and $\frac{1}{3}$ of opium in 4.

Prepared by beating into a mass, lead acetate 36 grs., opium 6 grs., syrup of glucose 4 grs.

Sedative, Narcotic, and Astringent. Dose—2 to 4 grs.

Suppositoria Plumbi Composita 3 grs. in each.

Prepared by mixing lead acetate 36 grs., opium 12 grs., oil of theobroma 132 grs., and dividing into 12 cones.

Anodyne and Astringent. Each contains 1 gr. opium.

Unguentum Plumbi Acetatis (See table on next page.)

Liquor Plumbi Subacetatis Fortis (Strong Solution of Lead Subacetate) 24 per cent. of $Pb_2O(C_2H_3O_2)_2$

(Synonym—Goulard's Extract.)

A colourless solution, becoming turbid on exposure to air, of lead subacetate in water, prepared by boiling lead acetate 5 ozs. with lead oxide 3½ ozs. in distilled water q.s. to make 1 pint.

Powerfully Astringent, but only used diluted.

Liquor Plumbi Subacetatis Dilutus (Diluted Solution of Lead Subacetate) 2 drs. in 1 pint.

(Synonyms—Goulard's Lotion ; Goulard Water.)

A colourless liquid, prepared by mixing strong solution of lead subacetate and alcohol (90 per cent.), of each 2 drs., with distilled water 19½ ozs.

An Astringent and Local Sedative.

Plumbi Carbonas $2PbCO_3$ & $Pb(HO)_2$

A soft, heavy, white powder, known as "White lead," prepared by interaction of lead, water, and carbonic anhydride in the presence of vapours of acetic acid. Not used internally ; externally, mildly Astringent.

Unguentum Plumbi Carbonatis (See table on next page.)

Plumbi Iodidum PbI_2

A bright yellow powder, prepared by interaction of lead nitrate or acetate and potassium iodide.

Resolvent and Antiparasitic.

Emplastrum Plumbi Iodidi 1 in 10.

A bright yellow solid, composed of lead iodide 2 ozs., lead plaster 1 lb., and resin 2 ozs.

Alterative and Resolvent to chronic enlargements.

Unguentum Plumbi Iodidi (See table on next page.)

Plumbi Oxidum PbO (Synonym—Litharge).

In heavy, yellowish-red or brick-red scales, obtained by the action of air on melted lead.

Used in making Liq. Plumbi Subacetatis Fortis, Plumbi Acetas, Glycerinum Plumbi Subacetatis, and the following :—

Emplastrum Plumbi (Lead Plaster).

A pale-yellow solid, consisting of oleate, palmitate, and stearate of lead, and a little glycerin; it is, chemically speaking, a *soap*. It is prepared by boiling in a steam-bath lead oxide 1 lb., olive oil 2 lbs., and water 16 ozs., for 4 or 5 hours, till a proper consistence is obtained. Known as Diachylon or Litharge Plaster.

A supporting Sedative and Protective application.

It enters into 9 plasters either as lead or resin plaster.

☞ Of the 12 official plasters, 9 contain lead. The exceptions are—E. Ammon. c. Hydrarg., E. Picis, and E. Menthol.

The following 4 plasters are often grouped together as the "Lead Plasters"—Plumbi, Plumbi Iodidi, Resinæ, and Saponis.

The lead is in the form of oleate, palmitate, and stearate, but chiefly as oleate.

OINTMENTS OF LEAD.

UNGUENTUM.	COMPOSITION.	COLOUR AND STRENGTH.
Plumbi Acetatis .. $Pb(C_2H_3O_2)_2,3H_2O$.	Acetate in fine powder 20 grs., paraffin ointment (white) 480 grs.	White, 1 in 25.
Plumbi Carbonatis .. $2PbCO_3$ & $Pb(HO)_2$.	Carbonate in fine powder ¼ oz., paraffin ointment (white) 2¼ ozs.	Cream, 1 in 10.
Plumbi Iodidi PbI_2.	Iodide in fine powder ¼ oz., paraffin ointment (yellow) 2¼ ozs.	Yellow, 1 in 10.
Glycerini Plumbi Subacetatis $Pb_2O(C_2H_3O_2)_2$.	Glycerin of subacetate 1 oz., paraffin ointment (white) 5 ozs.	White, 1 in 6.

PODOPHYLLI RHIZOMA (Podophyllum Rhizome)—Ranunculaceæ.

(Synonym—Podophyllum Root).

The brown, wrinkled and knotted, dry rhizome and roots of Podophyllum peltatum. It is also known as Mayapple or Mandrake.

Hydragogue Cathartic and Hepatic Stimulant. Dose—10 to 20 grs.

Its active principle is:—

Podophylli Resina (Podophyllum Resin).

A pale greenish-brown powder, prepared by pouring a concentrated alcoholic tincture of podophyllum rhizome into water, when the resin is precipitated; it is afterwards washed and dried. It is commonly called Podophyllin.

Dose—¼ to 1 gr. in pill; generally combined with aloes, &c.

Tinctura Podophylli 2 grs. in 1 dr.

Prepared by dissolving 320 grs. podophyllum resin in alcohol (90 per cent.) to 1 pint.

Dose—5 to 15 minims.

POTASSA CAUSTICA (Potassium Hydroxide) KHO

(Synonyms—Caustic Potash ; Potassium Hydrate).

Hydrate of Potassium, B.P., 1885.

In hard, white, deliquescent pencils or cakes, containing not more than 10 per cent. of combined water and impurities; prepared by interaction of potassium carbonate with calcium hydroxide. Soluble in $\frac{1}{2}$ its weight of water.

Acts as a powerful Caustic.

Is contained in Liquor Potassæ, and is used in making the Permanganate.

Liquor Potassæ 27 grs. Caustic Potash in 1 oz.

A colourless aqueous solution, containing in 110 minims 6·22 grs., or in 1 oz. 27 grs., of potassium hydroxide.

Antacid. Dose—10 to 30 minims, freely diluted.

Used in making the Bromide and Iodide of Potassium.

Potassa Sulphurata (Sulphurated Potash).

(Synonym—Liver of Sulphur).

A mixture of salts of potassium, of which the chief are potassium sulphides, in dark-green or liver-coloured, hard, flat fragments, prepared by fusing together potassium carbonate and sublimed sulphur.

Antiparasitic and Narcotic. Only used externally.

Potassii Acetas CH_3COOK

White, foliaceous, satiny, deliquescent masses, or granular particles, prepared by neutralising potassium carbonate with acetic acid, and fusing. Soluble in $\frac{1}{2}$ its weight of water.

Diuretic and mildly Cathartic.

Dose—10 to 60 grs. ; 1 to 3 grs. for a child 1 year old.

Potassii Bicarbonas $KHCO_3$

(Synonym—Potassium Hydrogen Carbonate).

Colourless, prismatic crystals, obtained by saturating a strong aqueous solution of potassium carbonate with carbonic anhydride. Soluble in four times its weight of water.

Antacid, Sedative, Diuretic, and Antilithic.

Dose—5 to 30 grs., in solution. 20 grs. are neutralised by 14 grs. citric and 15 grs. tartaric acid.

Potassii Bichromas (Potassium Bichromate) K_2CrO_4,CrO_3

(Synonyms—Red Chromate of Potassium ; Potassium Dichromate.)

In large, orange-red, transparent, triclinic crystals, obtained by roasting chrome ironstone with lime in presence of air, and treating the resulting chromate with a potassium salt, and subsequently with an acid.

Used in preparing Acid. Chromic.

Dose—$\frac{1}{10}$ to $\frac{1}{5}$ gr.

Potassii Bromidum KBr

Colourless, cubical crystals, obtained by adding bromine to a strong solution of potassium hydroxide, which forms a solution of bromide and bromate of potassium. This is evaporated to dryness, and the residue fused with charcoal, which converts the bromate into bromide; the product is purified by crystallization.

Hypnotic, and Sedative to the nervous system and the larynx.

Dose—5 to 30 grs., in solution. Soluble—1 in 2 of water.

Potassii Carbonas K_2CO_3 with either 1 or 2 molecules of water of crystallisation. (Synonym—Salt of Tartar.)

A white, crystalline, deliquescent powder, obtained from the ashes of wood, or by the interaction of crude potassium sulphate and crude calcium carbonate and carbon. It is soluble in an equal weight of water.

Action similar to the Bicarbonate.

Dose—5 to 20 grs.

It is used in the preparation of Decoct. Aloes Co., Liquor Arsenicalis, Potassa Caustica, Mist. Ferri Co., Potassa Sulphurata, Potassii Acetas, Potassii Bicarbonas, Potassii Citras, and Potassii Tartras.

Potassii Chloras $KClO_3$

In colourless crystals, prepared by passing chlorine into water holding lime or magnesia in suspension and treating the clarified liquid with potassium chloride, and crystallizing. Soluble in 16 parts of water.

Diuretic, and Alterative to diseased mucous surfaces.

Dose—5 to 15 grs., in solution.

It is used in the preparation of Potassii Permanganas, and

Trochiscus Potassii Chloratis 3 grs. in each.

A white lozenge, consisting of chlorate of potassium 3 grs., with rose basis.

Dose—1 to 6 lozenges.

Potassii Citras $C_3H_4,OH,(COOK)_3$

A white, deliquescent powder, prepared by neutralising a solution of citric acid with potassium carbonate.

A pleasant Refrigerant, Diaphoretic, and mild Laxative.

Dose—10 to 40 grs. in water (in which it is very soluble).

Potassii Iodidum KI

Colourless, cubical crystals, prepared like the bromide, using iodine instead of bromine.

Alterative and Resolvent in syphilis and scrofula.

Dose—5 to 20 grs., in pill or solution. Soluble in less than its own weight of water.

The following preparations contain this salt in the following quantities per 1 oz. ;—

Lin. Pot. Iod. cum Sapone 49 grs.
Liquor Iodi Fortis 26¾ grs. nearly.
Tinctura Iodi 10 grs. nearly.
Unguent. Iodi 17½ grs.
Unguent. Potassii Iod. 43¾ grs.

Linimentum Potassii Iodidi cum Sapone 1 in 10 by W.

A cream-like substance, prepared by dissolving 2 ozs. curd soap in 1 oz. glycerin and 10 ozs. water on a water bath, and triturating the solution with 1½ ozs. potassium iodide and adding 1 dr. oil of lemon.

Alterative and Resolvent, and does not stain the skin.

Unguentum Potassii Iodidi 1 in 10.

A white ointment, prepared by dissolving potassium iodide 50 grs. and potassium carbonate 3 grs. in distilled water 47 grs., and adding benzoated lard 400 grs.

Acts like the liniment.

Potassii Nitras KNO_3 (Synonyms—Nitre ; Saltpetre.)

In long, striated, prismatic crystals, or white crystalline masses, obtained by purifying the crude native nitre, or by the interaction of sodium nitrate and potassium chloride. Soluble 1 in 4 of water.

Diuretic and Diaphoretic. Dose—5 to 20 grs. in solution.

In—Argenti Nitras Induratus and Argenti Nitras Mitigatus.

Potassii Permanganas $K_2Mn_2O_8$

Dark-purple, slender, prismatic crystals, prepared by interaction of potassium chlorate, potassium hydroxide, and manganese dioxide.

Antiseptic, Deodorant, and Emmenagogue.

Dose—1 to 3 grs.

As it destroys all organic substances and decomposes most inorganic, it should be given only in water or pill.

Liquor Potassii Permanganatis 1 gr. in 110 minims.

A deep-purple liquid, half the strength of Condy's fluid, prepared by dissolving potassium permanganate 87½ grs. in distilled water to 20 ozs.

Dose—2 to 4 drs., in distilled water.

Potassii Sulphas K_2SO_4

In colourless, very hard, rhombic prisms, terminated by six-sided pyramids. May be obtained by purifying the crude native salt, or by the interaction of sulphuric acid and potassium chloride or certain other potassium salts.

A mild Cathartic. Dose—10 to 40 grs.

In—Pil. Colocynth. Co. and Pulv. Ipecac. Co., and their compounds.

Potassii Tartras $(CHOH)_2(COOK)_2H_2O$

Small, colourless, prismatic crystals, prepared from cream of tartar by neutralising it with potassium carbonate.

Hydragogue Cathartic and Diuretic. Dose—30 to 240 grs.

Potassii Tartras Acidus $(CHOH)_2COOH\ COOK$

(Synonyms—Bitartrate of Potassium ; Purified Cream of Tartar).

A gritty, white powder, or fragments of cakes crystallised on one surface, obtained from the crude cream of tartar, which is deposited during the fermentation of grape juice and from the lees of wine.

A Hydragogue Cathartic and Diuretic.

Dose—20 to 60 grs. As a purgative, $\frac{1}{4}$ to $\frac{1}{2}$ oz. (1 pint of water only dissolves about 50 grs.) It is elegantly administered with twice its bulk of orange marmalade.

Used in preparing Tartaric Acid, Tartar Emetic, Confection and Lozenge of Sulphur, Compound Jalap Powder, Tartarated Iron, Potassium Tartrate, and Sodium Potassium Tartrate.

PRUNI VIRGINIANÆ CORTEX (Virginian Prune Bark)—Rosaceæ.

The bark in irregular or incurved pieces of Prunus serotina, collected in autumn. Outer surface rough and brown ; inner surface fissured.

A Nerve Sedative and Tonic.

Syrupus Pruni Virginianæ 3 in 20.

Made by macerating and percolating 3 ozs. Virginian prune bark in No. 20 powder with water, collecting 9 ozs. of percolate, and dissolving in it, without heat, 15 ozs. sugar, and adding $1\frac{1}{4}$ oz. glycerin and water q.s. to make 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

Tinctura Pruni Virginianæ 1 in 5.

Prepared by macerating 4 ozs. Virginian prune bark in No. 20 powder in $7\frac{1}{2}$ ozs. distilled water for 24 hours, then continuing the maceration with $12\frac{1}{2}$ ozs. alcohol (90 per cent.)

Dose—$\frac{1}{2}$ to 1 dr.

PRUNUM (Prunes)—Rosaceæ.

The oblong, black, shrivelled, dried, ripe fruit of Prunus domestica *var.* Juliana.

A mild Laxative, entering into Confectio Sennæ.

PTEROCARPI LIGNUM (Red Sanders Wood)—Leguminosæ.

(Synonym—Red Sandal Wood).

Dense, heavy, dark reddish-brown billets (raspings or chips) of the heart-wood of Pterocarpus santalinus. The powder is blood-red.

Used only for colouring Tinct. Lavandulæ Co.

PYRETHRI RADIX (Pyrethrum Root)—Compositæ.

The dried root of Anacyclus Pyrethrum, in unbranched pieces about the size of the little finger, with brown bark studded with black points. Easily recognised by the prickling sensation when chewed. Known as Pellitory Root.

Powerful Sialagogue, greatly increasing the flow of saliva.

Tinctura Pyrethri 1 in 5.

A dark, sherry-coloured liquid, prepared by percolating pyrethrum root 4 ozs. with alcohol (70 per cent.) to 1 pint.

Used locally to promote the flow of saliva.

PYROXYLINUM (Pyroxylin).

Resembling cotton wool in appearance, and prepared by mixing sulphuric and nitric acids, 5 ozs. each, and immersing cotton 1 oz. in the mixture for 3 minutes, transferring it to a vessel of water, in which it is to be thoroughly washed, and drying on a water-bath. Commonly called Gun-cotton.

Enters into Collodium, Collodium Flexile, and Collodium Vesicans.

QUASSIÆ LIGNUM (Quassia Wood)—Simarubaceæ.

The yellowish-white (shavings, chips, or raspings or) large dense billets of Picræna excelsa.

Bitter Tonic without astringency; and, as it contains no tannin, it can be ordered with iron preparations.

Active principle—Quassin.

Infusum Quassiæ 88 grs. to 1 pint—cold (½ hour).

Prepared by infusing quassia wood, finely rasped, 88 grs. in *cold* distilled water 1 pint.

Dose—½ to 1 oz.

Liquor Quassiæ Concentratus 1 in 10.

Prepared by percolating 1 pint from quassia wood in No. 40 powder 2 ozs. with alcohol (20 per cent.) 22 ozs.

Dose—½ to 1 dr.

Tinctura Quassiæ 1 in 10.

A straw-coloured liquid, prepared by macerating quassia wood, rasped, 2 ozs. in alcohol (45 per cent.) 1 pint.

Dose—½ to 1 dr.

QUILLAIÆ CORTEX (Quillaia Bark)—Rosaceæ.

(Synonym—Panama Bark).

The inner bark, in large, brownish-white, flat pieces of Quillaja saponaria. Active principle—Saponin.

Expectorant, and emulsifying agent.

Used in making Liquor Picis Carbonis.

Tinctura Quillaiæ 1 in 20.

Obtained by percolating 1 oz. quillaia bark with alcohol (60 per cent.) to produce 1 pint.

Dose—½ to 1 dr.

QUININÆ HYDROCHLORIDUM $C_{20}H_{24}N_2O_2HCl,2H_2O$

(Hydrochlorate of Quinine, B.P., 1885).

The hydrochloride of an alkaloid, obtained from the bark of various species of cinchona and remijia, in crystals slightly larger than those of sulphate of quinine. Soluble in 35 parts of water.

Tonic, Antiperiodic, and Antipyretic. Dose—1 to 10 grs.

Tinctura Quininæ 1 in 50.

Hydrochloride of quinine 175 grs. dissolved in 1 pint tincture of orange.

Dose—½ to 1 dr.

Vinum Quininæ 1 gr. in 1 oz.

A golden, sherry-coloured liquid, prepared by dissolving quinine hydrochloride 20 grs. in orange wine 1 pint.

Dose—½ to 1 oz.

QUININÆ HYDROCHLORIDUM ACIDUM $C_{20}H_{24}N_2O_2,2HCl,3H_2O$

The acid hydrochloride of an alkaloid, from the same source as the hydrochloride, in the form of a white crystalline powder. Soluble in less than its own weight of water.

Action and dose same as the Hydrochloride.

QUININÆ SULPHAS $((C_{20}H_{24}N_2O_2)_2,H_2SO_4)_2,15H_2O$

The sulphate of an alkaloid obtained from the same source as the hydrochloride. In filiform, silky, snow-white crystals, soluble in 800 parts of water; it should not contain more than 3 per cent. of crystals of impure cinchonidine.

Tonic, Antiperiodic, Antineuralgic, and Antipyretic.

Dose—1 to 10 grs. Used in making Syr. Ferri Phos. c. Quin. et Strych.

Pilula Quininæ Sulphatis 5 in 6.

Obtained by mixing 30 grs. quinine sulphate with 1 gr. tartaric acid, and making a mass with a mixture of 4 grs. glycerin and 1 gr. tragacanth.

Dose—2 to 8 grs.

Tinctura Quininæ Ammoniata 1 in 50.

A colourless liquid, prepared by dissolving quinine sulphate 175 grs. in solution of ammonia 2 ozs. and alcohol (60 per cent.) 18 ozs.

Dose—½ to 1 dr., freely diluted.

Ferri et Quininæ Citras 6 grs. contain 1 gr. quinine. (See under Ferrum, page 233).

RESINA (Resin)—From Coniferæ.

The residue left after the distillation of the oil of turpentine from the crude oleo-resin (turpentine) of various species of Pinus, in translucent, yellowish, brittle, shining masses.

Used chiefly for its adhesive qualities in 8 Plasters, and

Emplastrum Resinæ 1 in 9½.

(Synonym—Adhesive Plaster).

A pale-yellow solid, prepared by melting together resin 4 ozs., lead plaster 32 ozs., and hard soap 2 ozs.

It enters into 3 Plasters.

Unguentum Resinæ 1 in 4 nearly.

A yellowish-brown, stiff ointment, prepared by melting together resin 8 ozs., yellow beeswax 8 ozs., olive oil 8 ozs., and lard 6 ozs. Often called Basilicon ointment.

A good Stimulating Application to indolent ulcers.

RHEI RADIX (Rhubarb Root)—Polygonaceæ.

The erect rhizome or so-called root, deprived of its bark and dried, of Rheum palmatum and R. officinale, and probably other species, from China and Thibet. In hard, compact, yellow, irregularly rounded pieces bored with a hole, with a marbled fracture exhibiting starlike spots; odour peculiar and aromatic.

Its active principle is allied to Cathartic Acid. Also contains Rheo-tannic Acid and Chrysophanic Acid.

Stomachic, Tonic, and Cathartic.

Dose—3 to 10 grs. for repeated administration; 15 to 30 grs. for single dose; 3 grs. for a child 1 year old.

Extractum Rhei

A brown dry extract, prepared by exhausting rhubarb root with alcohol (60 per cent.), and evaporating the tincture so produced to dryness.

Dose—2 to 8 grs.

Infusum Rhei 1 in 20 (¼ hour).

1 oz. rhubarb root sliced infused in 1 pint boiling water.

Dose—½ to 1 oz.

Liquor Rhei Concentratus 1 in 2.

A concentrated solution of rhubarb, prepared by macerating and percolating 10 ozs. coarsely powdered rhubarb root with alcohol (20 per cent) to produce 1 pint.

Dose—½ to 1 dr.

Pilula Rhei Composita 1 in 4 nearly.

Prepared by beating together rhubarb root 3 ozs., Socotrine aloes 2¼ ozs., myrrh and hard soap of each 1½ ozs., oil of peppermint 1½ drs., syrup of glucose 2¾ ozs.

Dose—4 to 8 grs.

Pulvis Rhei Compositus 1 in 4½.

(Synonym—Gregory's Powder).

A pale-yellow powder, turning red when moistened, prepared by rubbing together rhubarb root 2 ozs., light or heavy magnesia 6 ozs., ginger 1 oz.

Antacid, Stomachic, and Cathartic.

Dose—20 to 60 grs., in milk. For a child 1 year old, 5 grs.

Syrupus Rhei 1 in 15.

A brown thick liquid, prepared by exhausting 2 ozs. each rhubarb root and coriander fruit with distilled water 24 ozs. and alcohol (90 per cent.) 8 ozs., evaporating to 14 ozs., adding 24 ozs. sugar, and dissolving with gentle heat.

Dose—½ to 2 drs.; ½ dr. for a child 1 year old.

Tinctura Rhei Composita 1 in 10.

A dark-brown liquid, prepared by percolating with alcohol (60 per cent.), rhubarb root 2 ozs., cardamoms, freed from their pericarps, and coriander, of each ¼ oz., till 18 ozs. are obtained, and mixing this with 2 ozs. glycerin.

Dose—½ to 1 dr. for repeated administration; 2 to 4 drs. for single dose.

RHŒADOS PETALA (Red Poppy Petals)—Papaveraceæ.

The fresh, scarlet-coloured petals of Papaver Rhœas; used as a colouring agent.

Syrupus Rhœados 1 in 3½.

A rich red syrup, prepared by making an infusion of 13 ozs. fresh red poppy petals with distilled water 1 pint on a water-bath, and in this dissolving sugar 2¼ lbs., and adding alcohol (90 per cent.) 2½ ozs. Product 3 lbs. 10 ozs.

Dose—½ to 1 dr. (Used to colour mixtures.)

RICINI OLEUM (Castor Oil)—From Euphorbiaceæ.

The viscid, almost odourless and colourless oil expressed from the seeds of Ricinus communis.

Cathartic. Dose—1 to 8 drs. For a child 1 year old, 1 dr.

Enters into Collodium Flexile, Linimentum Sinapis Co., and Pil. Hydrarg. Subchlor. Co., and

Mistura Olei Ricini 3 drs. in 1 oz.

Prepared by mixing gradually and alternately castor oil 3 ozs. and a mixture of orange-flower water (undiluted) 1 oz. and cinnamon water 2½ ozs. with mucilage of gum acacia 1½ ozs.

Cathartic. Dose—As a draught, 1 to 2 ozs.

ROSÆ AQUA (Rose Water)—From Rosaceæ.

The rose water of commerce, prepared by distillation from the flowers of Rosa damascena (The Damask Rose). It is a saturated solution of the essential oil of the flowers, and is to be diluted, immediately before use, with twice its volume of water.

In—Mist. Ferri Co., and Rose basis for lozenges.

Unguentum Aquæ Rosæ (Rose Water Ointment).

A white ointment, commonly known as "cold cream," made by melting together white beeswax and spermaceti, of each 1½ ozs., and almond oil 9 ozs., adding gradually rose water 7 ozs. (undiluted) and oil of rose 8 minims.

A fragrant Emollient.

ROSÆ OLEUM (Oil of Rose)—From Rosaceæ.

(Synonym—Otto of Rose).

The fragrant, pale-yellow, crystalline, semi-solid oil distilled from the fresh flowers of Rosa damascena (The Damask Rose).

A powerful Odorant.

ROSÆ GALLICÆ PETALA (Red-Rose Petals)—Rosaceæ.

The purplish-red, unexpanded, velvety petals, fresh and dried, of Rosa gallica. From cultivated plants.

Astringent; chiefly used on account of their colouring.

Confectio Rosæ Gallicæ (Confection of Roses) 1 in 4.

A soft, violet-coloured mass, prepared by beating *fresh* red-rose petals 1 lb. with sugar 3 lbs.

Used as an Excipient for pill masses.

It enters into 3 pills bearing the name of Aloes, and into Pil. Hydrarg.

Infusum Rosæ Acidum 1 in 40 (¼ hour).

A bright red liquid, prepared by infusing *dried* red-rose petals ½ oz. in boiling distilled water 1 pint and diluted sulphuric acid 2 drs.

Astringent. Dose—½ to 1 oz.

Syrupus Rosæ 1 in 17.

A red syrup, prepared from 2 ozs. *dried* red-rose petals by making an infusion with 1 pint boiling distilled water (for 2 hours), squeezing through calico, heating to the boiling point, filtering, adding 30 ozs. sugar, and dissolving with gentle heat.

Dose—½ to 1 dr. Chiefly used for its bright red colour.

ROSMARINI OLEUM (Oil of Rosemary)—From Labiatæ.

The colourless or pale-yellow oil distilled from the flowering tops of Rosmarinus officinalis.

Stimulant and Rubefacient. Dose—½ to 3 minims.

It enters into Liniment. Saponis and Tr. Lavand. Co., and the following :—

Spiritus Rosmarini 1 in 10.

A colourless liquid, consisting of oil of rosemary 1 oz., dissolved in alcohol (90 per cent.) to 10 ozs.

SACCHARUM LACTIS (Milk Sugar) $C_{12}H_{22}O_{11},H_2O$

(Synonym—Lactose).

In white crystals or crystalline masses, obtained from the whey of milk.

Diuretic, and Sedative to the stomach, but generally used to dilute powders, as in Pulvis Elaterini Co.

SACCHARUM PURIFICATUM $C_{12}H_{22}O_{11}$

(Refined Sugar). (Synonym—Sucrose).

Colourless, inodorous separate crystals, obtained from the juice of the sugar cane. Used for its sweetening properties.

It enters into all the syrups and lozenges, 3 of the confections, some mixtures, pills, and powders, into Liq. Calcis Sac., Sodii Citro-Tart. Effervescens, and Mag. Sulph. Effervescens.

Syrupus 2 of sugar and 1 of water, or 1 in 1⅓.

A thick, colourless liquid, prepared by dissolving sugar 5 lbs. in distilled water 2½ lbs. Its specific gravity is 1·330, which is about the average density of the syrups.

It enters into Creosote Mixture, Pill of Iron, 9 syrups, and Confection of Sulphur.

Syrupus Aromaticus (Aromatic Syrup).

Prepared by mixing tincture of orange and cinnamon water of each 5 ozs., shaking with powdered talc, filtering and adding syrup, 10 ozs.

Used for Flavouring mixtures. Dose—½ to 1 dr.

SALICINUM (Salicin) $C_6H_{11}O_5OC_6H_4CH_2OH$—Salicaceæ.

A crystalline glucoside, in small, shining, colourless crystals, obtained from the bark of various species of Salix and of Populus.

Acts like Sodii Salicylas. Dose—5 to 20 grs.

SALOL (Salol) C_6H_4,OH,COO,C_6H_5

Insoluble, colourless crystals of phenyl salicylate, prepared by the interaction of salicylic acid and phenol, or of their sodium salts with phosphoryl chloride or carbonyl chloride.

An Intestinal Antiseptic and Analgesic. Dose—5 to 15 grs.

SAMBUCI FLORES (Elder Flowers)—Caprifoliaceæ.

The small, white flowers of Sambucus nigra, separated from the stalks.

Seldom employed, except as a Cosmetic to remove freckles.

Aqua Sambuci 1 in 1.

A colourless water, prepared by mixing fresh elder flowers 10 lbs. with water 5 gallons, and distilling 1 gallon. May be made with an equivalent quantity of the preserved flowers.

A fragrant basis for skin lotions.

SANTALI OLEUM (Oil of Sandal Wood)—Santalaceæ.

(Synonym—Oil of Santal Wood).

The thick, pale-yellow, aromatic oil distilled from the wood of Santalum album.

Diuretic ; like Copaiba. Dose—5 to 30 minims.

SANTONINUM (Santonin) $C_{15}H_{18}O_3$

The active principle of santonica—the dried, unexpanded flower-heads or capitula of Artemisia Maritima, var. Stechmanniana, in minute, colourless, flat, rhombic prisms, becoming yellow on exposure to light.

Anthelmintic—killing the round and thread worms.

Dose—For an adult, 2 to 5 grs. ; for a child 1 year, $\frac{1}{2}$ to $\frac{3}{4}$ gr. ; for a child 2 or 3 years old, 2 grs. ; and above 4 years, 3 grs.

It should, if possible, always be given in a tea-spoonful of castor oil, which greatly increases its efficacy and safety.

Trochiscus Santonini 1 gr. in each.

A white or yellowish-white lozenge, composed of santonin, with simple basis.

SAPO ANIMALIS (Curd Soap).

The white or greyish-white, horny, and nearly inodorous brittle soap made with sodium hydroxide and a purified animal fat, consisting principally of stearin ; contains 30 per cent. water.

Mildly Laxative, but chiefly used for its physical qualities.

In—Ext. Col. Co., Lin. Pot. Iod. C. Sapone, and Pil. Scammonii Co.

Sapo Durus (Hard Soap).

The dry, greyish-white soap, in appearance resembling curd

soap, but made with olive oil and sodium hydroxide. It is an oleate of soda.

Antacid and Laxative. Dose—5 to 15 grs., in pill.

Enters into 7 pill masses, Emp. Resinæ, Hydrarg. Oleas, and Ungt. Zinci Oleati.

Emplastrum Saponis 1 of soap in 7.

A white solid, prepared by melting hard soap 6 ozs., resin 1 oz., and lead plaster $2\frac{1}{4}$ lbs., stirring and evaporating.

A useful strapping for swollen joints ; acts mechanically.

Enters into Empl. Calefaciens and Empl. Cantharidis.

Pilula Saponis Composita 1 gr. opium in 5.

Prepared by beating together powdered opium $\frac{1}{2}$ oz., hard soap $1\frac{1}{2}$ ozs., syrup of glucose $\frac{1}{2}$ oz.

Narcotic. The name Pil. Saponis Co. is used to disguise its composition. Dose—2 to 4 grs.

Sapo Mollis (Soft Soap).

The yellowish-green, inodorous jelly, made with olive oil and potassium hydroxide, being an oleate of potassium.

Used in making Turpentine Liniment, and

Linimentum Saponis 1 in 12.

A clear, straw-coloured liquid, prepared by mixing and letting stand for 7 days soft soap 2 ozs., camphor 1 oz., and oil of rosemary 3 drs., in alcohol (90 per cent.) 16 ozs., diluted with distilled water 4 ozs.

A Stimulating Application to bruises and sprains ; sometimes called "Opodeldoc."

Enters into Linimentum Opii.

SARSÆ RADIX (Sarsaparilla)—Smilaceæ.

The dried, long, slender, reddish-brown root, covered with rootlets, of Smilax ornata, imported from Costa Rica, and commonly known as Jamaica sarsaparilla.

An Alterative and Diaphoretic.

Extractum Sarsæ Liquidum 1 in 1.

A deep, coffee-brown liquid, prepared by exhausting 20 ozs. sarsaparilla in 3 portions with alcohol (20 per cent.), using the percolate from the first to exhaust the second, and that from the second to exhaust the third. The third percolate is to measure 18 ozs., and 2 ozs. glycerin should be added to it.

Dose—2 to 4 drs.

Liquor Sarsæ Compositus Concentratus 1 in 1.

A dark brown liquid, prepared by infusing sarsaparilla 20 ozs. in 3 successive portions (of 5 pints each) of water at 160°F.;

also boiling sassafras root, guaiacum wood, dried liquorice root, of each 2 ozs., and mezereon bark 1 oz. with water till exhausted, mixing the two liquids and evaporating to 16 ozs., and adding 4½ ozs. alcohol (90 per cent.)

Dose—2 to 8 drs.

SASSAFRAS RADIX (Sassafras Root)—Lauraceæ.

The dried, brown root (in chips or shavings) of Sassafras officinale, in pieces covered with rusty brown bark.

Diaphoretic. Used only to flavour Liquor Sarsæ Co. Conc.

SCAMMONIÆ RADIX (Scammony Root) — Convolvulaceæ.

The dried, hard, tap-shaped roots, brownish-grey without, light or dark grey within, of Convolvulus Scammonia.

A griping Cathartic.

Only used for making:—

Scammoniæ Resina (Scammony Resin).

The brownish, translucent, brittle, resinous solid, prepared by exhausting scammony root with alcohol (90 per cent.), adding water (which throws down the resin), and then distilling off the alcohol and washing and drying the residue. It may be similarly prepared from scammony. Composed chiefly of Jalapin.

Dose—3 to 8 grs., in pill or powder, or rubbed up with milk.

It enters into Pil. and Extract. Colocynth. Co. and the following:—

Pilula Scammonii Composita 1 in 3 nearly.

Prepared by dissolving resins of scammony and jalap of each 1 oz., curd soap 1 oz., in tincture of ginger 3 ozs., and evaporating to a proper consistence.

Cathartic. Dose—4 to 8 grs.

Pulvis Scammonii Compositus 1 in 2.

A brown powder, prepared by mixing and sifting scammony resin 4 ozs., jalap 3 ozs., and ginger 1 oz.

An active Hydragogue Cathartic.

Dose—10 to 20 grs. 1 to 2 grs. for a child 1 year old.

SCAMMONIUM (Scammony).

A gum resin, obtained by incising the *living* root of Convolvulus Scammonia, in ash-grey and rough, cinder-like irregular fragments, with a black, shining, splintery, resinous fracture. Known as Virgin Scammony.

A powerful Cathartic. Dose—5 to 10 grs.

SCILLA (Squill)—Liliaceæ.

The dried, sliced, pear-shaped bulb of Urginea Scilla, divested of its outer scales; in dried, yellowish-white, tough, curved, dampish fragments or slices.

Active principles—Scillitoxin or Scillain and Scillipicrin.

Diuretic and Expectorant. Dose—1 to 3 grs.

Acetum Scillæ 1 in 8.

A pale straw-coloured liquid, prepared by macerating squill 2½ ozs. in dilute acetic acid 1 pint.

Dose—10 to 30 minims; generally given as Syr. Scillæ.

Oxymel Scillæ about 1 in 15.

A thick, opalescent, brownish liquid, prepared by macerating for 7 days squill 2½ ozs. in acetic acid 2½ ozs. and water 8 ozs. The product (about 10 ozs.) is mixed with liquefied clarified honey 27 ozs. or q.s. to give S.G. 1·32.

Dose—1 to 2 drs., as an Expectorant.

Pilula Scillæ Composita 1 in 4 nearly.

Prepared by mixing and beating into a uniform mass squill 1¼ ozs., ginger, ammoniacum, hard soap (all in fine powder), and syrup of glucose, of each 1 oz.

Dose—4 to 8 grs., as an Expectorant or Diuretic.

Syrupus Scillæ about 1 of squill in 17.

A thick, straw-coloured liquid, prepared by dissolving sugar 38 ozs. in vinegar of squill 1 pint.

Dose—½ to 1 dr., as an Expectorant; 1 oz., as an Emetic.

For a child 1 year old, 5 minims; as an Emetic, ½ to 1 dr.

As it contains acetic acid, it should not be ordered with alkalies. It is sometimes ordered by mistake with Spt. Ammon. Aromat.

Tinctura Scillæ 1 in 5.

A straw-coloured liquid, prepared by macerating bruised squill 4 ozs. in alcohol (60 per cent.) 1 pint.

Dose—5 to 15 minims.

Pilula Ipecacuanhæ cum Scilla *(Vide* Ipecacuanha).

It contains 1 part of opium, 1 of ipecacuanha, 3⅛ of squill, and 3⅛ of ammoniacum in 20 parts.

SCOPARII CACUMINA (Broom Tops)—Leguminosæ.

The fresh and dried tops, with their straight, angular, dark-green, smooth twigs, of Cytisus scoparius.

Active principles—Scoparin and Sparteine.

Diuretic; in large dose, Cathartic.

Infusum Scoparii 1 in 10 ($\frac{1}{4}$ hour).

Prepared by infusing bruised, dried broom tops 2 ozs. in boiling water 1 pint.

Dose—1 to 2 ozs.

Succus Scoparii

The brown juice obtained by bruising fresh broom tops in a stone mortar, and adding to every 3 measures of the fresh juice 1 measure of alcohol (90 per cent.), setting aside and filtering.

Dose—1 to 2 drs.

SENEGÆ RADIX (Senega Root)—Polygalaceæ.

The dried, yellowish-brown contorted root of Polygala Senega, from $\frac{1}{5}$ to $\frac{1}{3}$ inch in thickness, with a keel along its whole extent. (See under Valerian).

A Stimulating Expectorant.

Active principle—Senegin, which is identical with Saponin.

Infusum Senegæ 1 in 20 ($\frac{1}{2}$ hour).

Prepared by infusing senega root in No. 10 powder 1 oz., in boiling distilled water 1 pint.

Dose—$\frac{1}{2}$ to 1 oz. Used as a basis for cough mixtures.

Liquor Senegæ Concentratus 1 in 2.

A concentrated solution of senega, obtained by macerating and percolating 10 ozs. senega root with 25 ozs. of a mixture of 2 parts of alcohol (20 per cent.) and 1 part of alcohol (45 per cent.); the product to measure 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

Tinctura Senegæ 1 in 5.

A brown, sherry-coloured liquid, prepared by percolating senega root 4 ozs. in No. 40 powder with alcohol (60 per cent.) to produce 1 pint.

Dose—$\frac{1}{2}$ to 1 dr.

SENNA ALEXANDRINA (Alexandrian Senna)—Leguminosæ.

The greyish-green, lanceolate, acute leaflets, $\frac{3}{4}$ to 1 inch long, and unequally divided at the bases, of Cassia acutifolia. They are sometimes adulterated with Argel leaves, which are bitter, and have not an unequal oblique base.

Active principle—Cathartic Acid.

Cathartic. Dose—10 to 30 grs.

SENNA INDICA (East Indian Senna)—Leguminosæ.

(Synonym—Tinnivelly Senna). The green, lanceolate, acute leaflets of Cassia angustifolia, from 1 to 2 inches long, with an

unequal and oblique base. From plants cultivated in Southern India.

May be used instead of Alexandrian senna (which it resembles in dose and action) to make any of the following preparations :—

Confectio Sennæ 1 in 11.

A soft blackish mass, composed of powdered senna 7 ozs., powdered coriander 3 ozs., figs 12 ozs., tamarinds 9 ozs., cassia pulp 9 ozs., prunes 6 ozs., extract of liquorice 1 oz., sugar 30 ozs., distilled water 24 ozs. or q.s. ; prepared by boiling the figs and prunes in the water, adding the tamarind and cassia, rubbing the pulp through a sieve, in this dissolving the sugar and extract of liquorice and adding the powders, making the weight up to 75 ozs. with distilled water. Called "Lenitive electuary."

Laxative and Cathartic. Dose—60 to 120 grs.

Infusum Sennæ 1 in 10 ($\frac{1}{4}$ hour).

Prepared by infusing senna 2 ozs. and ginger 55 grs. in boiling distilled water 1 pint.

Dose—$\frac{1}{2}$ to 1 oz. As a draught, 2 ozs.

Enters into Mist. Sennæ Co.

Liquor Sennæ Concentratus 1 in 1.

Concentrated solution of senna, prepared by macerating and percolating 20 ozs. senna in 3 portions with distilled water, using the percolate from the first portion to exhaust the second, and that from the second to exhaust the third. The percolate from the third is to measure 16 ozs., and to this is added tincture of ginger $2\frac{1}{2}$ ozs., and alcohol (90 per cent.) 2 ozs.

Dose—$\frac{1}{2}$ to 1 dr.

Mistura Sennæ Composita 1 of $MgSO_4$ in 4.

(Synonym—Black Draught).

An almost black liquid, consisting of magnesium sulphate 5 ozs., liquid extract of liquorice 1 oz., aromatic spirit of ammonia 1 oz., compound tincture of cardamoms 2 ozs., infusion of senna to make 1 pint.

Hydragogue Cathartic. Dose—as a draught, 1 to 2 ozs.

Syrupus Sennæ 1 in 2.

A deep brownish-black liquid, prepared by percolating and repercolating 40 ozs. of senna in coarse powder with distilled water and alcohol (20 per cent.) and evaporating to produce 40 ozs. percolate, heating to 180°F. for 10 minutes; cooling, filtering, and dissolving at a gentle heat in the filtrate 50 ozs. sugar, and finally, after cooling, adding 10 mins. oil of coriander dissolved in 40 mins. of alcohol (90 per cent.).

A mild Cathartic.

Dose—$\frac{1}{2}$ to 2 drs. A child 1 year old may get $\frac{1}{4}$ to $\frac{1}{2}$ dr.

Tinctura Sennæ Composita 1 in 5

A dark liquid, prepared by macerating in 1 pint of alcohol (45 per cent.) the following :—Senna 4 ozs., raisins freed from seeds 2 ozs., caraway and coriander of each ½ oz.

Dose—½ to 1 dr. for repeated administration ; 2 to 4 drs. for single dose.

Pulvis Glycyrrhizæ Compositus 1 of senna in 6. (See Glycyrrhiza).

SERPENTARIÆ RHIZOMA (Serpentary Rhizome)—Aristolochiaceæ.

The small, round, knotty, yellowish-white, dried rhizome, with numerous slender rootlets, of Aristolochia Serpentaria or of A. reticulata. The rhizome of the latter is a little thicker and the rootlets larger and less matted. (See under Valerian).

Diaphoretic.

It enters into Tinct. Cinchonæ Co., and the following :—

Infusum Serpentariæ 1 in 20 (¼ hour).

Prepared by infusing serpentary rhizome 1 oz. in boiling distilled water 1 pint.

Dose—½ to 1 oz.

Liquor Serpentariæ Concentratus 1 in 2.

Prepared by macerating and percolating 10 ozs. serpentary rhizome with 25 ozs. alcohol (20 per cent.) to produce 1 pint.

Dose—½ to 2 drs.

Tinctura Serpentariæ 1 in 5.

A brown liquid, prepared by percolating serpentary in No. 40 powder 4 ozs. with alcohol (70 per cent.) to produce 1 pint.

Dose—½ to 1 dr.

SEVUM PRÆPARATUM (Prepared Suet).

The white, smooth, internal fat of the abdomen of the sheep —Ovis Aries—purified by melting and straining.

Used to give proper consistence to Ungt. Hydrarg.

SINAPIS (Mustard)—Cruciferæ.

Black and white mustard seeds, powdered and mixed, forming a greenish-yellow acrid powder.

Active principle is essential Oil of Mustard, obtained by the action of a ferment present in the seeds upon myronate of potassium in presence of water.

Emetic and Stimulant. Externally—Rubefacient.

Sinapis Albæ Semina (White Mustard Seed).

The hard, round, pale-yellow, finely pitted, dried, ripe seeds (1 line in diameter) of Brassica alba.

Sinapis Nigræ Semina (Black Mustard Seed).

The dark, reddish-brown or greyish-brown, round, hard, dried, ripe seeds (½ a line in diameter) of Brassica nigra.

Charta Sinapis

Prepared by extracting the fixed oil from equal weights of bruised black and white mustard seeds with benzol, drying and powdering the residue, and mixing 75 grs. with 5 drs. solution of India-rubber, and coating over with the semi-fluid mixture one surface of strips of cartridge paper. Before being applied, they should be dipped for a few seconds into tepid water.

Counter-irritant and Rubefacient.

Oleum Sinapis Volatile

The pale-yellow pungent oil distilled from the seeds of *Black* mustard after maceration with water. *It sinks in water.*

A powerful Irritant, producing instant Vesication.

Linimentum Sinapis 1 in 27.

Prepared by adding oil of mustard 1½ drs. to castor oil 5 drs., and adding the mixture to camphor 120 grs., dissolved in alcohol (90 per cent.) 4 ozs.

A Stimulating and Rubefacient Application.

SODA TARTARATA (Sodium Potassium Tartrate). $(CHOH)_2,COONa,COOK,4H_2O$

(Synonyms—Tartrate of Potassium and Sodium ; Rochelle Salt ; Tartarated Soda.)

Colourless transparent prisms, soluble in water ; prepared by neutralising acid potassium tartrate with sodium carbonate.

A Hydragogue Cathartic.

Dose—120 to 240 grs. Lemonade makes an agreeable vehicle.

Pulvis Sodæ Tartaratæ Effervescens (Effervescent Tartarated Soda Powder). Commonly called Seidlitz Powder.

Consists of 120 grs. tartarated soda and 40 grs. sodium bicarbonate, in a blue paper, dissolved in nearly half a pint of cold or warm water, to be taken in effervescence with 38 grs. tartaric acid, in a white paper.

Sodii Arsenas (Sodium Arsenate) Na_2HAsO_4

(Arseniate of Sodium (hydrous), B.P., 1885). Di-sodium hydrogen arsenate—a white anhydrous powder, soluble in 6 parts of water, obtained by exposing to a temperature of 300°F. crystallised sodium arsenate, which may be prepared by treating with water the product of the fusion of arsenious anhydride with sodium nitrate and sodium carbonate.

Alterative and Tonic. Dose—$\frac{1}{30}$ to $\frac{1}{10}$ gr.

Liquor Sodii Arsenatis 1 gr. in 110 minims.

A colourless solution of sodium arsenate (rendered anhydrous by a heat under 300°) 17½ grs. in distilled water 4 ozs.

Dose—2 to 8 minims, diluted, after meals.

Sodii Benzoas $C_6H_5,COONa$

A white powder, inodorous or having a faint benzoic odour, obtained by neutralising benzoic acid with sodium carbonate.

Diuretic. Dose—5 to 30 grs.

Sodii Bicarbonas $NaHCO_3$

In white powder, or small opaque, white crystals, soluble in 11 times their weight of water, prepared by saturating sodium carbonate with carbonic anhydride ; or by the reaction of sodium chloride and ammonium bicarbonate. Often called "Baking Soda."

Antacid. Dose—5 to 30 grs., in solution ; 24 grs. make an effervescing draught with ½ oz. lemon juice. (See Citric Acid).

20 parts are neutralised by 16·7 parts of citric acid or 17·8 of tartaric acid.

Enters into Sodii Citro-Tart. Efferves., Lithii Cit. Efferves., Pulv. Sodæ Tart. Efferves., Sodii Phosph. Efferves., Sodii Sulph. Efferves., Mag. Sulph. Efferves., and the following :—

Trochiscus Sodii Bicarbonatis 3 grs. in each.

White lozenges, composed of sodium bicarbonate and rose basis.

Sodii Bromidum NaBr

A granular, somewhat deliquescent, white powder, consisting of cubic crystals, obtained by adding bromine to sodium hydroxide till a permanent brown tint remains, evaporating to dryness, fusing with charcoal, dissolving out the bromide of sodium, and crystallising from warm solutions.

Antispasmodic. Sedative like KBr. Dose—5 to 30 grs.

Sodii Carbonas $Na_2CO_3,10H_2O$

In large, transparent, colourless, rhombic crystals, soluble in twice their weight of water, obtained from sodium chloride, either by reaction with ammonium bicarbonate and ignition, or by conversion into sulphate, and adding carbon and calcium carbonate and heating. It is known as "Washing Soda."

Antacid. 20 grs. neutralise about 9·8 of citric acid ; or 10·5 of tartaric acid.

Dose—5 to 30 grs., in solution.

Used in making Ext. Ergotæ ; and from it all of the sodium salts can be artificially obtained.

Sodii Carbonas Exsiccatus (Exsiccated Sodium Carbonate) Na_2CO_3

(Dried Carbonate of Sodium, B.P., 1885.)

A white powder, obtained by strongly heating sodium carbonate until it loses 63 per cent. of its weight, and reducing the residue to powder. It only differs from the crystallised carbonate in being devoid of water of crystallisation, and is nearly three times stronger (3 grs. = 8 grs).

Dose—3 to 10 grs., in pill or powder.

Sodæ Chlorinatæ Liquor $2\frac{1}{2}$ per cent. Cl.

A colourless solution, prepared by dissolving 24 ozs. sodium carbonate in 40 ozs. water, and adding 16 ozs. chlorinated lime mixed with 6 pints water, and filtering.

Antiseptic and Disinfectant. Dose—10 to 20 minims, diluted. As a gargle, $\frac{1}{2}$ dr. to 1 oz. water; as a lotion, 1 dr. to 1 oz. water.

Sodii Chloridum NaCl

In small crystalline grains, or in transparent cubical crystals, generally obtained by purifying common salt.

Purgative, Emetic, and Anthelmintic. Dose—$\frac{1}{2}$ to 1 oz.

Used in making Hydrochloric Acid, Calomel, and Corrosive Sublimate.

Sodii Citro-Tartras Effervescens

A mechanical mixture of sodium bicarbonate 51 ozs., tartaric acid 27 ozs., citric acid 18 ozs., sugar 15 ozs., all in powder, heated between 200° and 220°F. until the particles begin to aggregate, and then assiduously stirred till they become granulated.

Dose—60 to 120 grs. as a Refrigerant and Laxative.

Sodii Ethylatis Liquor (18 per cent. NaC_2H_5O).

A colourless or brownish, syrupy liquid, prepared by dissolving 22 grs. pure metallic sodium in 1 oz. absolute alcohol. Should be recently prepared.

Caustic; painted over nævoid and cancerous growths.

Sodii Hypophosphis $NaPH_2O_2$

A white, granular salt, soluble in its own weight of water, obtained by interaction of sodium carbonate and calcium hypophosphite.

Nervine Tonic and Restorative. Dose—3 to 10 grs.

Sodii Iodidum NaI

A white, crystalline powder, prepared like iodide of potassium by using sodium hydroxide instead of potassium hydroxide.

Alterative; like KI. Dose—5 to 20 grs.

Sodii Nitris $NaNO_2$

A white, deliquescent, crystalline salt, very soluble in water, obtained by fusing sodium nitrate with metallic lead.

Acts like Amyl Nitrite. Dose—1 to 2 grs.

Sodii Phosphas $Na_2HPO_4,12H_2O$

In large, transparent, colourless, rhombic prisms, soluble in 6 times their weight of water, prepared by the interaction of sodium carbonate and a solution of acid calcium phosphate produced on mixing bone ash and sulphuric acid.

Purgative and Diuretic.

Dose—30 to 120 grs. for repeated administration ; for single dose, $\frac{1}{4}$ to $\frac{1}{2}$ oz.

Used in making Ferri Phosph., and

Sodii Phosphas Effervescens 1 in 2.

A granular powder, prepared by heating 50 ozs. sodium phosphate, and mixing it with 50 ozs. sodium bicarbonate, 27 ozs. tartaric acid, and 18 ozs. citric acid, heating between 200° and 220°F., and stirring assiduously till granulation takes place. The product should weigh 100 ozs.

Aperient and Antacid.

Dose—60 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Salicylas $(C_6H_4,OH,COONa)_2H_2O$

In small, colourless, very soluble, crystalline scales, obtained by the action of salicylic acid on sodium carbonate or sodium hydroxide.

Antipyretic and Antirheumatic. Dose—10 to 30 grs.

Sodii Sulphas $Na_2SO_4,10H_2O$

In large, transparent, monoclinic, efflorescent prisms, soluble in half their weight of water ; may be obtained by interaction of sodium chloride and other sodium salts with sulphuric acid. Known as Glauber's Salt.

Hydragogue Cathartic.

Dose—30 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Sulphas Effervescens 1 in 2.

A granular powder, prepared by heating 50 ozs. sodium sulphate, mixing it with 50 ozs. sodium bicarbonate, 27 ozs. tartaric acid, and 18 ozs. citric acid, heating between 200° and 220°F., and stirring assiduously till granulation takes place. The product should weigh 100 ozs.

Aperient and Antacid.

Dose—60 to 120 grs. for repeated administration ; $\frac{1}{4}$ to $\frac{1}{2}$ oz. for single dose.

Sodii Sulphis $Na_2SO_3,7H_2O$

Colourless, transparent, monoclinic, efflorescent prisms, obtained by the action of sulphurous acid on sodium carbonate.

Antiseptic and Antiparasitic. Dose—5 to 20 grs.

Sodii Sulphocarbolas $C_6H_4OH,SO_2ONa,2H_2O$

(Sodium Sulphocarbolate or Sodium Phenol-para-sulphonate).

Colourless, transparent, rhombic prisms, obtained by dissolving phenol in excess of sulphuric acid, and converting the phenol-sulphonic acid so obtained into a sodium salt.

Antipyretic and Antiseptic. Dose—5 to 15 grs.

Sodium Na

The soft metallic element sodium, as met with in commerce, introduced into the B.P. to make Liquor Sodii Ethylatis. It should be kept in stoppered bottles, under mineral naphtha.

SPIRITUS RECTIFICATUS (Alcohol (90 per cent.).) C_2H_5OH

(Synonym—Rectified Spirit).

The colourless, transparent, mobile liquid, consisting of ethyl hydroxide 90 per cent. by vol. with 10 per cent. of water, obtained by the distillation of fermented saccharine fluids. S.G., ·834.

1 part to 3 of water makes "Spirit Lotion."

When alcohol and water are mixed, contraction of volume and rise of temperature take place. The cooled liquid is intended in the B.P.

The following four diluted alcohols are official—

Alcohol (70 per cent.), prepared by mixing 100 ozs. alcohol (90 per cent.) and 31 (or exactly 31·05) ozs. water.

Alcohol (60 per cent.) = 100 ozs. alcohol (90 per cent.) and $53\frac{2}{3}$ (53·65) ozs. water.

Alcohol (45 per cent.) = 100 ozs. alcohol (90 per cent.) and $105\frac{1}{3}$ (105·34) ozs. water.

Alcohol (20 per cent.) = 100 ozs. alcohol (90 per cent.) and $355\frac{3}{4}$ (355·8) ozs. water.

SPIRITUS VINI GALLICI (Brandy).

Being the pale brown liquid, distilled from wine and matured by age, and generally containing not less than $43\frac{1}{2}$ per cent. by volume of alcohol.

Mistura Spiritus Vini Gallici

Often known as Egg-flip; prepared by rubbing the yolks of two eggs with $\frac{1}{2}$ oz. sugar, and adding brandy and cinnamon water of each 4 ozs.

Nutritive, Restorative, and Narcotic.

Dose—As a draught, 1 to 2 ozs.

STAPHISAGRIÆ SEMINA (Stavesacre Seeds)—Ranunculaceæ.

The irregularly triangular, brown, dried, ripe seeds of Delphinium Staphisagria, with wrinkled and pitted testa.

Parasiticide. Active principles—Delphinine and Staphisagrine.

Unguentum Staphisagriæ 1 in 5.

Prepared by heating 2 oz. crushed stavesacre seeds with $8\frac{1}{2}$ ozs. benzoated lard on a water bath for two hours, and straining, and melting in it 1 oz. yellow beeswax.

Parasiticide, used to destroy pediculi.

STRAMONII FOLIA (Stramonium Leaves)—Solanaceæ.

The dried, greyish-green, ovate, petiolate, minutely wrinkled leaves of Datura Stramonium.

Active principle—Daturine (identical with Hyoscyamine).

Narcotic and Antispasmodic ; chiefly used in asthma.

Tinctura Stramonii 1 in 5.

A brown liquid, prepared by percolating stramonium leaves (powdered) 4 ozs. with alcohol (45 per cent.) to produce 1 pint.

Dose—5 to 15 minims, diluted.

Stramonii Semina (Stramonium Seeds)—Solanaceæ.

The small, reniform, pitted and wrinkled, brownish-black, flattened, dried, ripe seeds of Datura Stramonium.

Narcotic and Antispasmodic ; chiefly used in asthma.

Active principle—Daturine.

Extractum Stramonii

The firm, blackish extract, obtained by exhausting powdered stramonium seeds by percolation with alcohol (70 per cent.), distilling off most of the alcohol and evaporating to a firm extract.

Dose—$\frac{1}{4}$ to 1 gr., in pill.

STROPHANTHI SEMINA (Strophanthus Seeds)—Loganiaceæ.

The dried, ripe seeds of Strophanthus Kombé, freed from their awns. $\frac{3}{5}$ inch long and $\frac{1}{6}$ inch broad, greenish-fawn, and covered with silky hairs.

Active principle—Strophanthin. (See under Ouabain).

Cardiac Tonic like Digitalis.

Extractum Strophanthi 1 in 2.

Prepared by percolating 1 oz. strophanthus seeds (dried at 110° F.) with ether in order to remove oily matter, exhausting the marc with alcohol (90 per cent.), and evaporating the

resulting tincture till it begins to thicken, and then adding milk sugar to produce 2 ozs.

Dose—$\frac{1}{4}$ to 1 gr.

Tinctura Strophanthi 1 in 40.

Prepared by macerating and percolating $\frac{1}{2}$ oz. powdered strophanthus seeds with alcohol (70 per cent.) to produce 10 ozs., filtering and making up to 1 pint with alcohol.

Dose—5 to 15 minims.

STRYCHNINA (Strychnine)—$C_{21}H_{22}N_2O_2$—Loganiaceæ.

An alkaloid, in trimetric prisms, sparingly soluble in water, prepared from S. Nux Vomica and other species of Strychnos.

Spinal Stimulant. Dose—$\frac{1}{60}$ to $\frac{1}{15}$ gr.

Strychninæ Hydrochloridum $C_{21}H_{22}N_2O_2HCl,2H_2O$

(Hydrochlorate of Strychnine. B.P., 1885.)

The hydrochloride of an alkaloid, obtained from Nux Vomica and other species of Strychnos, in small, colourless, trimetric prisms, which readily effloresce in the air. Soluble in 35 parts water.

Dose and action like Strychnine.

Liquor Strychninæ Hydrochloridi 1 gr. in 110 mins.

(Solution of Hydrochlorate of Strychnine, B.P., 1885.)

A colourless solution of strychnine hydrochloride 17½ grs. in alcohol (90 per cent.) 1 oz., and distilled water q.s. to make 4 ozs.

Dose—2 to 8 minims, viz., $\frac{1}{35}$ to $\frac{1}{14}$ gr. of hydrochloride of strychnine.

STYRAX PRÆPARATUS (Prepared Storax).

Liquidambaraceæ.

A semi-transparent, brownish-yellow semi-fluid balsam, obtained from the trunk of Liquidambar orientalis, purified by solution in ethylic alcohol, filtration, and evaporation.

Expectorant, used in making Tinct. Benzoini Co.

SULPHONAL $(CH_3)_2C(SO_2C_2H_5)_2$

Sulphonal or dimethyl-methane-diethylsulphone in colourless, inodorous, tasteless, insoluble crystals, is a product of the oxidation of mercaptol, obtained from acetone and mercaptan.

A pure Hypnotic. Dose—10 to 30 grs.

SULPHUR PRÆCIPITATUM (Precipitated Sulphur) S

(Synonym—Milk of Sulphur).

A greyish-yellow, soft powder, free from grittiness, prepared by dissolving sublimed sulphur by boiling in water with lime,

and then precipitating with hydrochloric acid, washing and drying the precipitate.

Laxative. Dose—20 to 60 grs.

Sulphur Sublimatum (Sublimed Sulphur) S

(Synonym—Flowers of Sulphur).

A gritty greenish-yellow powder, prepared, more or less directly, from native sulphur or sulphides.

Laxative and Antiparasitic. Dose—20 to 60 grs.

In addition to Emp. Hydrarg., Emp. Ammon. cum Hydrarg., and Pulv. Glycyrrhizæ Co., it enters into the following :—

Confectio Sulphuris 1 in 2½.

A soft, yellow paste, prepared by rubbing together sublimed sulphur 4 ozs., acid potassium tartrate 1 oz., tragacanth 18 grs., syrup 2 ozs., tincture of orange ½ oz., and glycerin 1½ ozs.

Dose—60 to 120 grs.

Trochiscus Sulphuris 5 grs. in each.

Lozenges containing precipitated sulphur, cream of tartar, sugar, gum, mucilage, and tincture of orange.

Dose—1 to 6 lozenges.

Unguentum Sulphuris 1 in 10.

A yellow ointment, prepared by rubbing sublimed sulphur 1 oz. with benzoated lard 9 ozs.

Antiparasitic ; used in itch, &c.

Sulphuris Iodidum SI

A greyish-black, shining solid, prepared by heating together in a flask, iodine 4 ozs. and sublimed sulphur 1 oz.

Counter-irritant and Antiparasitic.

Unguentum Sulphuris Iodidi 1 in 25.

A brown ointment, gradually becoming black, prepared by triturating in a warmed mortar sulphur iodide 20 grs. with glycerin 20 grs., and by degrees adding benzoated lard 460 grs.

An Antiparasitic and Stimulating Application.

SUMBUL RADIX (Sumbul Root)—Umbelliferæ.

The dried, brown, spongy, transverse slices of the root of Ferula Sumbul.

Nervine Stimulant and Antispasmodic.

☞ Sumbul Root is distinguished from Calumba, which it slightly resembles, by its open spongy texture and strong musky odour.

Tinctura Sumbul 1 in 10.

A brown, sherry-coloured liquid, prepared by macerating Sumbul root bruised 2 ozs. in alcohol (70 per cent.) 1 pint.

Dose—½ to 1 dr.

Syrupus and Syrupus Aromaticus (See Saccharum).

TAMARINDUS (Tamarind)—Leguminosæ.

The sweet, brown, soft, fibrous pulp (containing brown, shining seeds), being the fruit of Tamarindus indica, freed from the brittle outer part of the pericarp, and preserved with sugar.

Laxative and Refrigerant. Dose—½ to 1 oz. or more.

It enters into Confectio Sennæ.

TARAXACI RADIX (Taraxacum Root)—Compositæ.

The smooth, tapering, *fresh* tap root, or the brown, wrinkled, *dried* tap root of Taraxacum officinale, gathered in autumn.

Diuretic, Laxative, Tonic, and feeble Cholagogue.

Extractum Taraxaci

A rich brown "fresh or green" extract, prepared by evaporating the expressed juice of the fresh root, as in making Ext. Colchici.

Dose—5 to 15 grs., in solution in water, or in pill.

Extractum Taraxaci Liquidum 1 in 1 *(dried root)*.

A dark liquid, prepared by exhausting 20 ozs. *dried* dandelion root with 2 pints alcohol (60 per cent.), pressing out 10 ozs., treating the marc with water and evaporating to 10 ozs., filtering, and mixing the liquids.

Dose—½ to 2 drs.

Succus Taraxaci

A brown liquid, prepared by pressing out the juice from *fresh* dandelion root, and adding to every three measures one measure of alcohol (90 per cent.).

Dose—1 to 2 drs.

TEREBENUM (Terebene).

An aromatic colourless liquid, consisting of a mixture of dipentene and other hydrocarbons, obtained by agitating oil of turpentine with sulphuric acid until it no longer rotates a ray of polarised light, and then distilling in a current of steam.

Antiseptic, Stimulating Expectorant. Dose—5 to 15 minims.

TEREBINTHINA CANADENSIS (Canada Turpentine)—Coniferæ.

(Synonym—Canada Balsam).

The straw-coloured, ductile oleo-resin, or turpentine (as thick as honey), obtained from Abies balsamea (Balm of Gilead Fir).

A Stimulating Expectorant; used for its adhesive qualities.

Dose—20 to 30 grs.

Enters into Collodium Flexile.

TEREBINTHINÆ OLEUM (Oil of Turpentine)—Coniferæ.

The limpid, colourless oil, distilled, usually by the aid of steam, from the oleo-resin (turpentine) obtained from Pinus sylvestris and other species of Pinus, rectified if necessary.

Stimulant, Diuretic, Anthelmintic, and Cathartic. Externally —Rubefacient. The vapour is Astringent.

Dose—2 to 10 mins.; as an Anthelmintic, 3 to 4 drs., on sugar, or in capsules, or emulsion, or rubbed up with twice its bulk of mucilage.

Linimentum Terebinthinæ 13 in 20.

A pale-yellowish emulsion, prepared by dissolving camphor 1 oz. in oil of turpentine 13 ozs., adding it gradually to a mixture of soft soap 1½ ozs., and distilled water 2 ozs., and making up to 1 pint with water.

Counter-irritant and Rubefacient.

Linimentum Terebinthinæ Aceticum 4 in 9.

A mixture of 4 ozs. oil of turpentine, 1 oz. glacial acetic acid and 4 ozs. liniment of camphor. A substitute for "St. John Long's Liniment," which was made with yolk of egg.

An excellent Rubefacient.

THEOBROMATIS OLEUM (Oil of Theobroma).

Sterculiaceæ.

(Synonym—Cacao Butter).

The yellowish, solid concrete oil, in cakes, expressed from the warm ground seeds of Theobroma Cacao.

Used in the preparation of all the Suppositories except Glycerin.

THUS AMERICANUM (Frankincense)—Coniferæ.

The yellow, opaque, tough, solid turpentine or oleo-resin scraped off the trunks of Pinus palustris and Pinus Tæda.

Externally—Stimulant.

Enters into Emp. Picis.

THYMOL (Thymol)—$C_{10}H_{13}HO$—Labiatæ and Umbelliferæ.

A crystalline substance, in large, prismatic, odorous crystals, obtained from the volatile oils of Thymus vulgaris, Monarda punctata, and Carum copticum. Purified by recrystallisation from alcohol.

Antiseptic and Deodorant. Dose—½ to 2 grs.

THYROIDEUM SICCUM (Dry Thyroid).

A light, dull brown powder, which is liable to become damp and to deteriorate by exposure to air; prepared from the fresh and healthy thyroid gland of the sheep. The glands are taken from the sheep immediately upon being killed, the external fat

and connective tissue are removed, and the glands cut across. Any which are abnormal are rejected. The healthy are minced, dried at 90° to 100°F., powdered, washed with petroleum spirit to remove all fat, and again dried.

Restorative in Myxœdema and Cretinism.

Dose—3 to 10 grs.

Liquor Thyroidei (Thyroid Solution) 100 mins = 1 gland.

Prepared from the *fresh and healthy* bruised gland of the sheep, by adding 34 mins. each glycerin and solution of phenol (·5 per cent.), straining, pressing, and adding ·5 per cent. solution of phenol to make 100 minims for each entire gland used ; forming a pinkish turbid liquid free from putrescence.

Must be freshly prepared, and kept in well-stoppered bottles.

Dose—5 to 15 minims.

TRAGACANTHA (Tragacanth)—Leguminosæ.

A whitish, gummy exudation, in horny, curved plates (like the parings of corns), obtained by incising Astragalus gummifer and other species of Astragalus. Known as Syrian Tragacanth.

Used only for its property of swelling out when moistened with water, and forming a mucilage.

It enters into Pulv. Opii Co., Confect. Sulphuris, Mist. Cretæ, Mist. Guaiaci, and

Glycerinum Tragacanthæ 1 in 5½ by weight.

A homogeneous, translucent jelly, prepared by mixing ½ oz. tragacanth, in powder, with 1½ ozs. glycerin and ½ oz. water.

A good Pill Excipient.

Mucilago Tragacanthæ 60 grs. in 10 ozs.

A thick opaque liquid, prepared by mixing powdered tragacanth 60 grs. with alcohol (90 per cent.) 2 drs., and pouring in distilled water to make 10 ozs.

Enters into Lotio Hyd. Nig.

Pulvis Tragacanthæ Compositus 1 in 6.

A white powder, composed of tragacanth, gum acacia, and starch, of each 1 oz., and sugar 3 ozs.

Dose—As a Demulcent, 20 to 60 grs.

TRINITRINI TABELLÆ (Trinitrin Tablets)

(Synonym—Tablets of Nitroglycerin). Tablets of chocolate each weighing 5 grs., and containing $\frac{1}{100}$ gr. trinitroglycerin of commerce.

Dose—1 or 2 tablets. Act like Amyl Nitrite, but more slowly.

Liquor Trinitrini 1 per cent. by weight, or 1 gr. in 110 mins.

(Synonym—Solution of Nitroglycerin).

A colourless liquid, containing trinitroglycerin of commerce in alcohol (90 per cent.). Dose—½ to 2 mins.

TROCHISCUS BASES (See page 179.)

UVÆ URSI FOLIA (Bearberry Leaves)—Ericaceæ.

The small, dried, yellowish-green, shining leathery leaves of Arctostaphylos Uva-ursi.

Active principle—Arbutin.

Astringent, Diuretic, and Sedative to the bladder.

Infusum Uvæ Ursi 1 in 20 (¼ hour).

Prepared by infusing bruised bearberry leaves 1 oz. in boiling distilled water 1 pint.

Dose—½ to 1 oz.

VALERIANÆ RHIZOMA (Valerian Rhizome)—Valerianaceæ.

(Synonym—Valerian Root).

The dried, yellowish-brown rhizome, with numerous bushy bundles of fibrous roots springing from it, of Valeriana officinalis. Collected in autumn.

Active ingredients—A Volatile Oil and Valerianic Acid.

Antispasmodic.

☞ Valerian, Serpentary, Arnica, and Senega are often confounded, and the student should remember a few of the distinguishing points. Thus Senega, which is very like Serpentary and Valerian, is recognised by its keel or ridge, which is not marked on the smaller rootlets, but which may be seen, like a little mesentery, at the bendings of the roots, which are of a pure *white* colour internally. The rootlets of Serpentary are smaller than those of Valerian, and are destitute of the strong, unpleasant odour of that drug. Arnica is distinguished by its dark-brown colour, aromatic odour, and peppery taste.

Tinctura Valerianæ Ammoniata 1 in 5.

A very dark, reddish-brown liquid, prepared by macerating valerian rhizome in No. 40 powder 4 ozs. in a mixture of oil of nutmeg 30 mins., oil of lemon 20 mins., 2 ozs. solution of ammonia, and 18 ozs. alcohol (60 per cent.)

Diffusible Stimulant. Dose—½ to 1 dr., freely diluted.

VERATRINA (Veratrine).

An alkaloid or mixture of alkaloids, in pale grey, amorphous masses, or in powder, obtained from Cevadilla, the dried, ripe seeds of Schœnocaulon officinale (Melanthaceæ), by adding a concentrated tincture of the seeds to water (which throws down albumen and resinous matters). The watery liquid, after

filtration, throws down the alkaloid on the addition of ammonia. This is purified by solution in acidulated water and further precipitation by ammonia.

Should not be given internally.

Unguentum Veratrinæ 1 in 50.

A nearly white ointment, prepared by warming veratrine 10 grs. with oleic acid 40 grs., and adding benzoated lard 450 grs.

Local Anæsthetic. Used in neuralgia like Aconitine.

VINUM XERICUM (Sherry).

A pale yellowish-brown, Spanish wine, containing about 16 per cent. of alcohol; enters into all the wines but Aurantii, Quininæ, and Ferri Citratis—viz., into Antimoniale, Colchici, Ferri, and Ipecacuanhæ.

ZINCI ACETAS $Zn(C_2H_3O_2)_2,3H_2O$

In thin, translucent, colourless, crystalline plates of a pearly lustre, soluble in $2\frac{1}{2}$ times their weight of water; prepared by neutralising acetic acid with zinc carbonate.

Dose—1 to 2 grs. as a Tonic; 15 to 20 grs. as an Emetic. Chiefly used as an injection in gonorrhœa (2 grs. to 1 oz.).

Zinci Carbonas $ZnCO_3(ZnH_2O_2)_2,H_2O$

Zinc hydroxycarbonate, a white insoluble powder, is prepared by interaction of zinc sulphate and sodium carbonate.

Mildly Astringent.

Employed in making the Oxide, Valerianate, and Acetate of Zinc.

Zinci Chloridum $ZnCl_2$

In opaque, white, deliquescent rods or tablets; soluble almost entirely in half their weight of water; prepared by interaction of zinc and hydrochloric acid.

Only used externally as a powerful Caustic, mixed with 1, 2, or 3 parts of flour or powdered starch.

Liquor Zinci Chloridi 366 grs. in 1 oz.

A heavy, colourless liquid, prepared by boiling 1 lb. of granulated zinc in 44 ozs. hydrochloric acid and 20 ozs. distilled water, and filtering. If iron or lead be present add chlorine solution and carbonate of zinc to precipitate the iron or lead impurities attacked by the chlorine, and evaporate the filtered liquid to the bulk of 40 ozs. If no iron or lead be present the chlorine and carbonate of zinc need not be employed.

Antiseptic. Known as "Burnett's Fluid" (which is only half its strength).

Zinci Oxidum ZnO

A soft, nearly white, insoluble powder, prepared by exposing the carbonate to a dull red heat; or from metallic zinc by combustion, and when thus prepared it is white.

A Tonic in spasmodic nervous disorders. Externally—A mild Astringent, and Absorbent in weeping skin affections.

Dose—3 to 10 grs. in pill; often combined with belladonna in night sweating.

Used to prepare the sulphocarbolate.

Unguentum Zinci 1 in $6\frac{2}{3}$.

A white ointment, prepared by adding oxide of zinc 3 ozs. to melted benzoated lard 17 ozs., and stirring till cold.

Unguentum Zinci Oleatis 1 in 2.

Prepared by dissolving zinc sulphate 2 ozs., in water 4 ozs.; and hard soap 4 ozs., in water 40 ozs.; mixing, collecting, washing, and drying the precipitated oleate of zinc, and mixing with an equal weight of white soft paraffin.

Action similar to Ungt. Zinci.

Zinci Sulphas $ZnSO_4,7H_2O$

In small, colourless, prismatic crystals, obtained by interaction of diluted sulphuric acid and zinc.

☞ Often known as White Vitriol, and distinguished from Epsom salt (which it *closely* resembles) by its powerfully styptic taste.

Dose—1 to 3 grs. as a Tonic; 10 to 30 grs. as an Emetic; 3 grs. as an Emetic for a child 1 year old. As an Astringent in gonorrhœa 2 grs. to 1 oz., and in ophthalmia 1 gr. to 1 oz.

Employed in making the Carbonate and Valerianate, and Ungt. Zinci Oleatis.

Zinci Sulphocarbolas $Zn(OH,C_6H_4,SO_3)_2H_2O$

Zinc sulphocarbolate or phenol-para-sulphonate, in colourless tabular crystals, obtained by heating a mixture of phenol and sulphuric acid, and saturating the product with zinc oxide.

Antiseptic.

Zinci Valerianas $Zn(C_5H_9O_2)_2$

Zinc valerianate or iso-valerianate, in minute, brilliant, white, pearly, tabular crystals, with the odour of valerian, sparingly soluble in water; prepared by saturating iso-valerianic acid with zinc carbonate, or by the interaction of zinc sulphate and sodium iso-valerianate.

Antispasmodic and Nervine Tonic. Dose—1 to 3 grs.

ZINGIBER (Ginger)—Zingiberaceæ.

The scraped and dried rhizome of Zingiber officinale, in irregular, lobed, yellowish-white chalky pieces.

Active principles—A Volatile Oil, and Gingerin or Gingerol.

Carminative and Antispasmodic. Dose—10 to 20 grs.

Syrupus Zingiberis 1 in 40.

A straw-coloured, muddy syrup, prepared by adding 1 oz. of a strong tincture of ginger, obtained by percolating ½ oz. ginger in fine powder with alcohol (90 per cent.), and adding it to syrup sufficient to produce 20 ozs.

Dose—½ to 1 dr.

Tinctura Zingiberis 1 in 10.

A sherry-coloured liquid, prepared by percolating ginger in powder 2 ozs. with alcohol (90 per cent.) to make 1 pint.

Dose—½ to 1 dr., diluted.

In addition to the above, Ginger and its compounds enter into 14 Pharmacopœial preparations, viz. :—

Infusion of Senna.
Compound Mixture of Senna.
,, Pill of Squill.
,, ,, Gamboge.
,, ,, Scammony.
,, Powder of Cinnamon.
,, ,, of Jalap.
Compound Powder of Opium.
,, ,, Rhubarb.
,, ,, Scammony.
Aromatic Sulphuric Acid.
Pill of Aloes and Iron.
Acid Infusion of Cinchona.
Concentrated Solution of Senna.

PART IV.

THERAPEUTICS.

Acacia Gummi is of feeble nutritive value, a portion of it being converted into sugar in the intestines before absorption. The remainder, unless retained in the bowel for a long time, may pass out with the fæces. It is chiefly used on account of its physical qualities for making emulsions and suspending insoluble powders in mixtures. It contains a diastatic ferment, and its solutions are prone to undergo changes which lead to the formation of irritating compounds, and in medicine only the freshly-prepared mucilage should be used.

It is administered in inflamed conditions of the *throat, gullet, and stomach;* as a basis for cough mixtures; and as a demulcent in the after treatment of cases of irritant poisoning. It acts *mechanically* by covering over the affected surface and preventing the contact of foreign matter or irritating secretions, and in *intestinal catarrh* it may give relief when more soluble agents fail.

A piece chewed in the mouth often affords relief by acting as a Ciliary Excitant, aiding the expulsion of tough mucus probably by exciting the cilia to increased activity through reflex stimulation of the vagus, as will be more fully mentioned in speaking of the action of some expectorants.

In mild cases of *chronic bronchitis*, or where there is hypersecretion of the mucus from the larynx, trachea, and larger bronchi, oftentimes associated with winter-cough, it may be found of service, by its soothing or demulcent action upon the irritated endings of the nerves of the fauces and pharynx which, by reflex action, intensify the tracheal or bronchial cough.

Acetanilide or Antifebrin—In ordinary medicinal doses this drug has no effect upon the temperature of the body in health. In large amounts it alters the composition of the blood and changes its colour, the red cells are destroyed, and methæmoglobin is formed, and the urine is coloured by it.

Small doses raise the blood pressure, but large ones lower it and cause serious depression or paralysis of the heart. The drug is excreted by the kidneys.

In febrile conditions the temperature is reduced with certainty and rapidity after one to two hours, and generally with perspiration, but the effects are transient, and sometimes followed by depression. It seems certain that the fall is caused by diminished heat production from the action of the drug upon the thermic centres, and though the sweating aids the reduction by the extraction of heat it takes place when the skin is dry under the administration of belladonna. Though its action in *typhus*, *typhoid*, and all *fevers*, in *pneumonia*, *acute rheumatism*, *phthisis*, and nearly every feverish state is most marked, it is nevertheless very questionable treatment to employ the drug as a routine antipyretic in these diseases, as its effects so rapidly pass off without producing permanent good, and in very high fever (hyperpyrexia) it is not to be relied upon. In the short fever of *influenza*, *catarrh*, and *sore throat*, it may be employed with benefit in doses of 3 or 4 grs., repeated every 3 or 4 hours.

As an analgesic the drug is of great value, and its power of relieving the pain of *migraine*, *neuralgia*, and other allied conditions is remarkable. It is liable to produce, even in the above-mentioned doses, symptoms of an alarming character of which cyanosis, rigors, gasping respiration, and formidable collapse are prominent, but these generally pass off soon after the administration of hot drinks and stimulants. A few deaths have been attributed to its use, though recovery followed a dose of 450 grs.

The drug is less soluble, but much less expensive than antipyrine, and may be used in tabloids, powders, or cachets in all conditions in which antipyrine is indicated. The general verdict of late years seems to be that it is not so safe as phenacetin or antipyrine.

Acidum Aceticum is a refrigerant when administered in a very dilute form. It does not appreciably reduce temperature, but in fever it produces a grateful feeling of coolness by allaying thirst, through its increase of the secretion of the salivary and other glands distributed in the mucous membrane of the mouth and throat.

It is mildly astringent and diuretic. Notwithstanding its power of drying up the bronchial mucus, as stated by Rossbach, vinegar in small doses is a very popular remedy for loosening cough and increasing expectoration. Externally, acetic and glacial acetic acids are caustics, and will produce redness, vesication, and sloughing, in proportion to the strength of the acid and the duration of its application. Both the acids dissolve epithelium, and are used to destroy *warty growths;*

and they have been recommended as local remedies in *cancer*, with the intention of *dissolving* the cancer cells. A weak solution of acetic acid or vinegar sponged over the body in fevers is of use in lowering the temperature, probably by reflex action. When applied undiluted to *ringworm* it kills the parasite. Vinegar has some local astringent properties, and is used as a hæmostatic in *post-partum hæmorrhage*.

The vapour of the strong acid applied to the nostrils is used as a restorative in *cardiac depression;* it acts by reflexly stimulating the vaso-motor centre and raising the blood pressure throughout the body.

The prolonged use of this acid diminishes the number of the red blood corpuscles, causing anæmia and loss of weight, and it is improperly used to correct obesity. The acids in the undiluted state are powerful poisons.

Acidum Arseniosum in large doses is a powerful poison, causing in half an hour a burning sensation in the throat, stomach, and abdomen, rapidly followed by violent vomiting, colicky pains, diarrhœa, cramps, excessive thirst, exhaustion, and collapse—a group of symptoms not unlike English *cholera*. Death results from paralysis of the heart, and of the respiratory centre without cerebral excitement or mental symptoms. After death there are found swelling and redness, with occasional patches of softening of the gastro-enteric mucous membrane, and if the patient have survived long enough, fatty degeneration of the liver, kidneys, and cardiac muscle. These effects are observed whether the arsenic be taken by the mouth, or injected into a vein, or applied to an open absorbing surface. The poison is excreted in the urine, and in the evacuations, saliva, tears, serosity of a blister, and in the sweat; it can be readily detected in the parenchymatous tissues, and has been found abundantly present in the grey matter of the cord. Many instances of fatal results have been reported where no gastro-enteric symptoms have been present and no signs of such noticed after death, the patient having died in a few hours after profound coma and nerve symptoms.

Of the various theories intended to explain the poisonous action of arsenic two may be mentioned. Ringer explains it by classifying arsenic as a profound protoplasmic poison. Binz has satisfied himself by experiments that the poisonous results are caused entirely by the drug acting as a *carrier and discharger of loosely combined oxygen*. He found that in the organism arsenious is converted into arsenic acid, and arsenic acid is converted into arsenious acid, and that the transformation is effected inside and outside the body by means of living protoplasm, and that arsenic consequently must be regarded merely as a carrier of oxygen, the oxygen being the active agent. It acts on the

compact tissue of bone somewhat after the same manner as phosphorus.

Symptoms of poisoning with arsenic are not uncommonly observed in those working with arsenical pigments, or in those living in rooms whose walls are covered with paper containing arsenical pigments ; and they may be produced by the free use of the drug, as a remedy for disease. There are œdema of the eyelids, especially of the lower one, irritability of the membranes covering the eye-ball, nose, pharynx, and trachea, short, dry cough, anorexia, vomiting, colic, diarrhœa and prostration. Sometimes nervous symptoms, as tremors, headache, and partial paralysis of the lower extremities, symptoms of peripheral neuritis, and bronzing of the skin like Addison's disease are observed, especially in those cases where the poison has been absorbed through the respiratory tract.

In small doses ($\frac{1}{50}$ gr.) it acts by its *local* influence on the gastric mucous membrane, as a stomachic, increasing the digestive powers and stimulating the appetite ; it is valuable in *gastric neuralgia* and occasionally in *ulcer* and irritative *dyspepsia*, and in the vomiting of chronic *alcoholism*, and in *diarrhœa* coming on immediately after eating ; in these cases 1 to 2 minims of Fowler's solution *before* food may be given with advantage. In larger doses ($\frac{1}{20}$ gr.) arsenic acts as a nerve tonic, rapidly gaining an entrance into the blood by absorption, it does not form albuminates like other metals in the stomach ; it is carried to the nerve centres and alters their nutrition in some mysterious manner, thus it is found to possess anti-periodic properties second only to quinine, hence its value in *neuralgia*, *angina*, and *ague*.

In *chronic malarial conditions* which resist quinine, arsenic is most useful, and it is well in such cases to begin with a full dose, $\frac{1}{15}$ gr. It is said to act as a *prophylactic* against malaria.

In *asthma* it has been successful, especially in the form of cigarette combined with stramonium, and internally in combination with iodides.

In *chorea* its best effects are observed, but it must be given in full doses, and it may be necessary to push it till the well-known physiological effects are observed, viz. :—redness of the conjunctiva, with smarting and swelling of the eyelids, especially the lower one ; signs of irritation in the membrane of the nose, throat, and mouth, and indigestion, vomiting, and griping. The writer has given 15 minims of Fowler's solution thrice daily without producing symptoms of irritation.

Arsenic should not be used in acute cutaneous affections. It is in *chronic*, scaly, and papular skin diseases that its great benefit is proved. In *psoriasis*, *lichen*, and even in chronic *eczema* and *acne*, it cures when all other remedies fail, but its action is slow.

Its best effects are thus seen in those diseases which affect the superficial layers of the skin.

It has specific action in *pemphigus*, and it has been used successfully as a subcutaneous injection in *multiple sarcoma of the skin*. Large lymphomatous malignant tumours have disappeared under its internal and subcutaneous use, and it is the best remedy in Hodgkin's disease.

In *malignant anæmia* and in *chlorosis*, arsenic often rapidly tells, even after iron has failed, and it may be frequently combined with this drug advantageously.

It may be used with benefit in the early stages of *phthisis* and *catarrhal pneumonia*. Brunton believes that by increasing the tissue changes in the epithelial contents of the alveoli—(fatty degeneration of these cells is a constant result of chronic arsenical poisoning)—it assists in rapidly breaking up and removing effused inflammatory products, and so prevents the bacillus of tubercle finding a suitable nidus.

Many authorities administer the drug as a routine treatment in ordinary phthisis, and affirm that it reduces temperature and checks the disease.

Externally, arsenic is a powerful caustic, causing the death of the tissue to which it is applied, chiefly by the profound inflammation which it induces. In *cancer*, *lupus*, and *epithelioma*, its use has been advocated; but it is dangerous, as enough may be absorbed to cause death, unless applied in a concentrated form and to a very limited extent of surface.

Skill and experience are necessary for the successful use of arsenic in the removal of small epithelial tumours, and it is rather to be regretted that surgeons now-a-days very seldom avail themselves of this remedy; and many have not only no experience of it, but strongly discountenance every treatment but the knife. The result too often is seen—especially in the case of epithelial cancer—that the patient shrinks from the knife, and absolutely refuses all operative interference till too late.

It is the chief remedy amongst the "cancer curers" in the North of Ireland. Some of them, no doubt, knowing nothing of the power of their weapon, cause great disfigurement, and even loss of life; but others with experience and skill contrive to produce marvellously good results, with no disfigurement and little suffering.

Sir Astley Cooper's ointment consists of 1 dr. arsenic, 1 dr. sulphur, and 1 oz. spermaceti ointment, applied for 24 hours.

Hebra's paste consisted of arsenious acid 5 parts, cinnabar 1 part, and simple ointment 8 parts.

Fowler's solution has been used to remove *warts* and *corns*; Abernethy's lotion consisted of 2 drs. Fowler's solution to 1 oz. water.

Arsenic, unless when given for its *local* action upon the stomach, should always be given soon after a meal, and its effects closely watched for a short time, as some are (though rarely met with) very susceptible to its action, and it is a good rule to begin always with 2 minims of Fowler's solution ($\frac{1}{50}$ gr. arsenic), which may be increased cautiously till 10 or even 15 minims are reached. Children bear large doses. A choreic child 5 years old may commence with 2 or 3 minims, gradually increased to 10, or even more. It rests upon unquestionable authority that the natives of Styria habituate themselves to swallowing lethal doses with impunity.

The iodide is given in skin diseases in the form of pills containing $\frac{1}{30}$ to $\frac{1}{15}$ gr., and Donovan's solution is a remedy of great value in the *tertiary* forms of syphilis. Asiatic Pills contain $\frac{1}{15}$ gr. arsenious acid with $\frac{3}{4}$ gr. pip. nig. and gum acacia in each.

℞. *Liquor. Arsenicalis* ℥iss.
Tinct. Ferri Perchlor. ℥ii.
Aquæ Camphoræ ad ℥iv. *Misce.*

Fiat mistura. Capiat ℥j. *mensura ter in die post cibos, ex aqua.*

☞ For the treatment of poisoning by arsenic see Index of Poisons at the end of the book.

Acid. Benzoicum possesses antiseptic properties superior to those of carbolic and salicylic acids. When taken in moderate doses (15 grs.) it remains unaltered as benzoic acid in the blood, but it unites in the kidneys with glycocoll, and is excreted as hippuric acid, rendering the urine acid. It thus acts as a diuretic, and, on reaching the bladder, it exercises an alterative and antiseptic action on its lining membrane in mild *chronic cystitis*, with high smelling, alkaline urine depending upon obstructed flow. It is indicated also in *pyelitis*, and is sometimes found useful in intractable *urethral* affections, accompanied by smarting pain on micturition. It does not interfere with the elimination of uric acid. Though possessed of expectorant properties, it is inferior in this respect to the gum from which it is extracted.

Benzoic acid possesses all the antipyretic properties of salicylic acid, and is used in *acute rheumatism* by Senator in preference to that drug. It may be given in doses of 30 grs., and the soda salt may be used as a substitute for sodium salicylate.

Acid. Boricum is an antiseptic without any irritating qualities, causing the destruction of low organisms without

endangering in any way the vitality of the living tissues. Hence its great value in surgery as a dressing, either in the form of the official ointment or as a lotion (5 per cent.), or as Boracic Lint, prepared by soaking lint in a hot saturated solution of the acid, and drying. According to Kurz it checks suppuration when applied locally, by paralysing the white blood corpuscles as they emerge through the vascular walls.

Boroglyceride—a transparent solid (prepared by Barff by heating boracic acid 62 parts and glycerin 92 parts), can be used as a lotion in the same way as boracic acid. It has a powerful effect in preserving milk and food against putrefaction, and is innocuous.

Stockings dipped in a hot solution of the acid, and dried, check effectually *fetid perspiration* of the feet. It was supposed to have anodyne properties, hence its old name of Homberg's Sedative Salt. 10 grs. to 1 oz. water make a good injection for *gonorrhœa*, *purulent ophthalmia*, and *otorrhœa*, and in this latter affection it may be loosely packed into the meatus. Packing the vagina with the dry acid and absorbent wool gives splendid results in bad *leucorrhœa*. Perez used it internally in *bladder* affections associated with decomposing urine. There are few more striking effects to be observed in the entire range of therapeutics. 10 to 15 grs. three times a day in 2 ozs. water will often, after a few doses, cause clear, odourless urine to flow where foul and putrid secretion had existed for months. It acts as an antiseptic on its elimination at the various outlets of the body, and in *diarrhœa* and *fermentative* states of the contents of the stomach its use may be tried.

The writer tried its effects in *typhoid fever*, but found that the stomach was upset by doses sufficient to saturate the system. He often saw excellent results from small doses.

2 or 3 grs. blown into each nostril every 4 hours by an insufflator have yielded good results in *pertussis*. Made into an ointment with lanoline it speedily relieves the *eczema* of children. A strong solution may be used for washing out the bladder where the internal use of the acid cannot be tolerated.

Dr. T. K. Wheeler has shown the writer two cases where general desquamation followed the internal use of the acid.

Acid. Carbolicum is a powerful antiseptic and antizymotic, destroying minute forms of animal and vegetable life, rapidly arresting fermentation, and precipitating albumen. It destroys in very dilute solution the organised, and in stronger solution the unorganised, ferments, at the same time *deodorising* their foul smelling and poisonous products. It is useful in chronic *gastric* complaints, accompanied with offensive eructations, acting like creosote ; it destroys sarcinæ, and stops fermentation in the stomach, where, by its local action, it often allays sickness

and vomiting and stops diarrhœa. The sulphocarbolates of sodium and potassium act in a similar way, and have been used in *typhoid* and other *fevers*, and with success in *ulcerative endocarditis*.

Carbolic acid inhaled, as vapour or atomised spray, acts very effectually in checking the expectoration of *chronic bronchitis*, is invaluable in *gangrene of the lung*, and has the power of cutting short *influenza*. Used as a gargle (1 in 150), or as a spray (1 in 100), or as a lozenge in various pharyngeal affections, it causes anæsthesia of the mucous membrane, diminishing the reflex irritability in the palatal and other muscles, thus effectually preventing distressing attempts at swallowing, and by this means cutting short the course of *acute tonsillitis*, and relieving follicular *pharyngitis*. The spray affords the best local routine treatment in *diphtheria*.

It is in its external application that carbolic acid has won for itself a high name among surgical remedies. Applied to the skin it acts as a painless caustic, causing the death of a very superficial film, and in a similar way it may be painted over exuberant granulations. The lotion (1 oz. to 1 quart) effectually destroys the foul smell of *sores* and *ulcers*, exciting in them healthy action, and hastening the healing process. Applied to *fresh wounds*, it diminishes the risk of profuse suppuration, and is invaluable as a dressing after *amputations*.

Carbolic acid, when applied to the skin or wounds, in concentrated solution, acts as a local anæsthetic, diminishing sensibility, and if the cork of the carbolic acid bottle be laid against the skin so as to affect a small area with the acid, the hypodermic or aspirator needle can be almost painlessly inserted. Its anæsthetic effect when applied to carious teeth is often marked, for this purpose it is best mixed with collodion (1 to 3). It is used successfully as an application to various *parasitic skin diseases*, and the pure acid is the best caustic we possess for *uterine ulcerations*. A strong solution applied to an extensive raw surface may cause gangrene of a limb or it may be absorbed, and produce the same poisonous effects as a large internal dose, causing violent *gastro-intestinal irritation*, *syncope*, *disturbance of respiration*, *muscular weakness*, *coma*, with contracted pupils, and *convulsions* by its action on the vaso-motor centre, medulla, and cord ; hence, when *extensively* employed, its effects should be watched, the urine through which it is eliminated often turning almost black. Serious symptoms may supervene without this dark discoloration, and Bruce advises that the urine should be tested for disappearance of sulphates in cases where fainting and collapse supervene during the use of carbolic dressing—the absence of sulphates indicating danger. Poisonous doses at first cause a rise in the blood pressure, which soon gives place to a

great fall; as paralysis of the nerve centres, respiration, and heart occurs, the blood becomes dark and loses its coagulability.

The drug is not eliminated by the bronchial surface, as it probably unites with sulphates in the blood.

Deep hypodermic injections of ½ gr. of the acid in 20 minims of water have been found most successful in deep-seated *inflammations*, *glandular* and *joint swellings*, *erysipelas*, *poisoned wounds*, *synovitis*, &c. ½ gr. in 5 mins. of water injected into piles causes their rapid disappearance.

Sir A. Clark treated *hay-asthma* by applying the following with a brush to the pharynx through the nares—Glycerin of Carbolic Acid 1 oz., Hydrochlorate of Quinine 1 dr., Corrosive Sublimate ½ grain.

The acid is best administered in the form of a pill; for external application, 1 in 40 of water is the strength of the "Lotion" used for all ordinary purposes. "Carbolic Oil" composed of 1 part acid and 10 parts olive oil is practically useless as a germ destroyer.

℞. *Acidi Carbolici* ℥i.
Aquæ Rosæ ℥xii. *Misce.*
Fiat solutio. Signa—"*To be used as a spray for the throat every two hours.*"

Acid. Chromicum possesses the power of killing all low organisms, oxidising organic matter, coagulating albumen and destroying the tissues with which it comes in contact. It is thus an antiseptic, disinfectant, and caustic, and is chiefly used in the concentrated form to destroy *condylomata*, warty, and other superficial growths, which it does effectually. A lotion of 10 grs. to 1 oz. has a decided effect upon *syphilitic and gouty diseases of the tongue and throat.* A 3 per cent. solution brushed over the feet checks sweating of the parts, but if abrasions be present dangerous irritation may result. Death has resulted several times from the absorption of the acid when too freely applied externally.

Acid. Chrysophanic. (See Chrysarobin.)

Acid. Citricum and Succus Limonis, identical in action with tartaric acid, are grateful refrigerants, a small quantity sucked in the parched mouth producing a refreshing moisture by stimulating the salivary glands, and probably also all the glands of the mucous membrane down to the stomach. When administered in health, the urine becomes acid under their use, but in *fevers* they do not increase the acidity of the urine. The neutral salts of the vegetable acids act as refrigerants, but they differ from the acids in increasing the alkalinity of the

blood, being oxidised and converted into carbonates, in which state they pass out in the urine, increasing its alkalinity or rendering it alkaline if acid. Citric and tartaric acids are largely used in medicine to make effervescing draughts, which, on being swallowed whilst the carbonic acid is being given off, act as sedatives to the mucous membrane of the stomach, the gas having a soothing influence upon the terminal filaments of the nerves of this organ. Upon page 189 will be found a useful table of the requisite proportions of different alkalies to make an effervescing mixture, and below is the formula for one of these. Lemon juice acts like citric acid, but is found to be more efficacious in *scurvy*, acting in some way as a blood restorative, and, in addition to being a specific in this disease, it is a prophylactic. It has been administered in *acute rheumatism.* A decoction of *fresh* lemon is believed to possess antiperiodic powers, and is strongly recommended in *ague*, where its effects are said to be equal to quinine and arsenic. A solution of citric acid is largely used as a substitute for lemon juice. It has feeble antiseptic properties.

℞. *Potassii Bicarbonatis* ℥vj.
Aquæ Destillatæ ℥xij.

Solve, capiat cochlearia duo ampla cum succi limonis recentis cochleare amplo in effervescentia ter in die.

Acid. Gallicum and Acid. Tannicum are vegetable astringents. Tannic acid coagulates albumen, gelatin, and mucus, but gallic does not. The way in which these substances produce their astringent effect cannot, however, be explained upon merely chemical principles. They were generally supposed to act by "tanning" or "condensing" the skin, tissues, and membranes with which they came in contact, and it was believed that when taken internally they acted directly upon the muscular tissue in the arterial coats and lessened the calibre of the small vessels. Rosenstirn's experiments, however, prove that the vessels are dilated, and that the partly chemical and partly vital action of these acids is yet to be explained.

Gallic acid has no local astringent action. Tannic acid, when administered, is changed to gallic in the stomach and intestines, and as such passes into the fæces and urine, hence gallic acid is chiefly the one selected for internal administration, whilst tannic acid is selected when a local effect is desired. Stockman found that when pure tannin was given by the mouth, gallic acid appeared in the urine along with *traces* of tannin, but when tannate of soda was given *large* quantities of tannin with a *little* gallic acid appeared in the urine, the uncombined tannin being at once changed into a tannate of albumen in the stomach,

which, being slow of absorption, has time in the intestines to be almost entirely converted into gallic acid. Tannate of soda, on the other hand, being rapidly absorbed by the stomach, passes out in the urine without change. He finds that solutions of both acids *dilate* the blood vessels, and he concludes that as remote astringents these acids are valueless save in the faint action they possess in common with all acids in diminishing the alkalinity of the blood and thus increasing its coagulability. Notwithstanding the absence of all proof, that tannic and gallic acids have any action as astringents after absorption, they are still used by many in *internal hæmorrhages*, in *excessive secretions* from different parts of the body, and for cutting short *local inflammations*, as in various forms of *sore throats*, *nasal catarrh*, and *gonorrhœa*. By their action the secretion of the *bowel* is lessened, and the contents become more solid, owing to the *local* action of the drug as it passes down the tube before absorption, and hence its value in *diarrhœa*. It has been found useless in *albuminuria*, but has still some advocates as a remedy for *phthisis*. Either acid may be given in 5 to 10 gr. doses, dissolved in water, or made into a pill with a little glycerin. The gall and opium ointment is an astringent remedy for painful *hæmorrhoids*, and the glycerin of tannin for enlarged tonsils and relaxed conditions of the throat. Tannic acid may be applied directly to bleeding surfaces as a styptic to stop hæmorrhage.

Tannic acid is used as an antidote in *poisoning by the alkaloids* to form tannates which are only partially soluble.

Acid. Hydrobromicum has sedative properties much inferior to the bromine salts. (See under Bromum.) It is a good solvent for the quinine salts, and is administered with the view of preventing their unpleasant effects.

Acid. Hydrochloricum, Nitricum, and Sulphuricum when applied externally, act as powerful corrosives and escharotics when undiluted, and when administered internally in their strength they act similarly, destroying the tissue of the digestive tract, and producing the well-known effects of corrosive poisons. In both these cases their action may be regarded as *chemical*, as they in like manner act upon dead tissues. These results are explained by their action on albumen and by their great affinity for water, which they abstract so rapidly as to cause the death of the tissue containing it. Nitric acid is the one selected when we wish to avail ourselves of this property, and it is used in *phagedænic ulceration* and *sloughing* by applying the strong acid with a stick. It destroys all unhealthy tissue, at the same time altering the condition of the surrounding living parts so that diseased action is stopped, and a new healthy action set up. It is likewise used to destroy *warty growths* and to

stimulate *sluggish ucers*, and it is useful when applied to the interior of the *uterus* in chronically inflamed conditions. Its action is very superficial, because it cannot redissolve the albumen which it precipitates and which thus limits its penetration into the tissue.

Strong hydrochloric acid, diluted with an equal weight of honey (making a linctus), is used to destroy the false membrane in *diphtheria* and *ulcerations of the throat.*

Strong sulphuric acid is used as an application to *carious bone*, to the interior of *disorganised joints*, *cancer* and *chancres*, and phosphoric acid also acts as a powerful caustic. Diluted with from 200 to 300 times their bulk of water, they form good astringent lotions for sluggish *sores*, or gargles for relaxed conditions of the *throat.* Roberts recommends an injection of weak nitric acid to dissolve phosphatic stones in the bladder.

Internally, the mineral acids stimulate the alkaline secretions of the body and, according to Ringer, check the acid ones; thus the saliva, bile, and intestinal juice are increased, and the secretion of acid gastric juice lessened. This gives us an explanation of the value of these acids in *dyspepsia.* Hydrochloric acid, which is a constituent of the gastric juice, is particularly useful in chronic *gastric* complaints, a dose administered *before* a meal checking the excessive irritating acid secretion and stimulating the appetite; whilst *after* a meal, in a different class of cases, the digestion is accelerated by supplying the deficiency of acid, as pepsin refuses to dissolve proteids unless free acid is present.

℞. *Acid. Hydrochlor. Dil.* ℥iv.
Tinct. Calumbæ ℥iv.
Inf. Aurantii ad ℥viij. *Misce.*

Fiat mistura, cujus capiat cochleare amplum ter in die ex aqua ante cibos.

The mineral acids are rapidly absorbed, having great diffusive power, and on entering the blood they combine with bases, freeing weaker acids from their salts, and thus rendering the blood less alkaline. Whilst passing through the liver they probably influence the tissue changes which take place between the blood and the hepatic cells, as their administration diminishes the amount of urea secreted. They are thus cholagogues. They appear in the urine as salts of urea. They have an astringent effect upon the muscular tissue, and consequently are useful in checking *hæmorrhages.* The dilute or aromatic sulphuric acid, in 20 minim doses, freely diluted, answers the purpose well, and also checks *sweating.*

As regards the astringency of the mineral acids, sulphuric is

the strongest and hydrochloric the weakest, and their effect upon the bowel is probably *local*.

The free administration of the diluted mineral acids renders the urine slightly more acid than the normal condition, and hence their indication in the *oxalic* and *phosphatic diatheses*, but these remedies do not cause the already alkaline urine to become acid.

In *fevers*, the administration of the diluted mineral acids (the Swedish treatment) is followed by good results. They make up for the deficiency of acid in the gastric juice, which is a feature in fever; they increase the saliva and remove the parched condition of the throat and tongue; they help to neutralise the excessive alkalinity of the blood, and to correct the acrid alkaline motions of *typhoid fever*.

Acid. Hydrocyanic. Dil. is the most rapid poison known, killing, if administered in a concentrated form, in less than a minute, by acting as a profound nerve and cardiac sedative, and paralysing the brain, cord, and motor nerves. After a large dose the patient falls, his respiration becomes convulsive, pupils dilated, and face congested, death ensuing by rapid asphyxia, succeeding convulsions and coma, though the blood in a quickly fatal case may be florid in the veins; the tissues lose the power of absorbing oxygen. Brunton believes that the florid colour of the venous blood is not, as is believed, caused by diminution of the oxidising power of the blood, but is owing to the rapidity of its flow through the dilated peripheral vessels, which prevents the usual tissue change. If life be prolonged the blood becomes dark.

It is used in medicine chiefly on account of its sedative action when applied to the peripheral extremities of irritated or painful nerves; hence its use in painful *gastric* disorders, accompanied by *vomiting*, 3 minim doses in *gastric ulcer* or *cancer* often giving much relief, and, by blunting the sensibility of the nerves, it is useful in the reflex vomiting of *pregnancy*, for the cough of *phthisis*, and externally for allaying the itch of *urticaria*, *lichen*, &c., when applied in those latter cases as a lotion of 1 in 40, care being taken that the skin is not broken.

The preparations of bismuth may be ordered with great advantage with Prussic acid in stomach affections.

☞ For Poisoning see Index of Poisons at the end of the book.

℞ *Acidi Hydrocyanici Dil.* *m.* lx.
Bismuthi Carb. *gr.* lxxx.
Mucilaginis Recentis ℥iss.
Aquam ad ℥iv. *Misce.*
Fiat mist. cujus capiat ℥j. *ter in die, ante cibos p.p.a.*

Acid. Lactic. possesses properties similar to those of the mineral acids as described under Hydrochloric. The dilute acid has a solvent action when applied in *diphtheria*. Internally it is a valuable aid in *atonic dyspepsia*, and a grateful refrigerant which has done good service in *diabetes* and *vesical catarrh*. Sour buttermilk will be found superior in most respects to lactic acid for internal use. This the writer has often proved, especially in the vomiting of *chronic Bright's disease*, and in the *phosphatic diathesis*. The writer has used the strong syrupy acid with success in *lupus;* it only attacks the diseased tissue, and is not very painful, and it leaves a good scar. See "Dictionary of Treatment," page 483. Lennox Browne has successfully applied a 50 per cent. solution in *pharyngeal* tubercle.

Acid. Nitric.—See Acid. Hydrochloric., under which head its chief uses are mentioned.

Acid. Nitro-Hydrochlor. Dil. is a valuable cholagogue. (See under Acid. Hydrochlor.) As a restorative in prostration and loss of appetite, following prolonged mental labour, combined with a vegetable bitter, in 15 to 20 minim doses, it will be found the most satisfactory and efficient tonic we possess. It should be *recently prepared.* Used in the form of a bath in chronic *congestion of the liver*, by mixing 1 oz. strong nitric and 2 ozs. hydrochloric acids with 2 gallons water at 98°, it will be often found useful.

Acid. Oleic. and **Oleates.**—The B.P. oleates are used as substitutes for mercurial and zinc ointments, whose actions they closely resemble.

Acid. Phosphoric. has no properties beyond those possessed by the mineral acids, as described under Acid. Hydrochloric. It is refrigerant and tonic, and is supposed by some to have the power of dissolving phosphatic deposits and bony tumours. It makes an agreeable drink in *diabetes*, but has none of the therapeutical virtue of free phosphorus. The concentrated acid is a strong caustic, and Grossich advocates the use of a 10 per cent. solution as a dressing for *ulcers* and an injection into *scrofulous glands and joints*.

Acid. Salicylic. is a powerful antiseptic and antiferment. A 2 per cent. solution speedily kills bacteria and stops fermentation. It is used as a surgical dressing either in the form of "lint" or "wadding," or "ointment" (1 to 27), or "lotion" (acid 10 parts, borax 20, water 100). Whilst the power and certainty of its action as an antiseptic, together with its mildness, combine to make it so valuable, it has the great disadvantage of being *non-volatile*. It has been used with benefit as a local antiseptic application in *diphtheria*, and a solution in collodion (1 to 2) speedily destroys *corns* and *lupus*, acting only on the *diseased* cells.

The soda salt has little lethal effect upon germs; a solution has been used as a local application to the joints in *acute rheumatism*, in itching from *eczema* and various causes, and to check fetid perspirations in the feet and armpits.

Salicylic acid, in doses of about 15 to 20 grs. every 2 or 3 hours, soon produces effects in the healthy individual like quinine —fulness in the head, buzzing in the ears, disturbances of vision, and if the dose be very considerably increased in frequency and amount, other more alarming symptoms supervene, as deafness, squinting, sighing respiration, restless delirium, with dark albuminous urine, involuntary evacuations, and convulsions (it does not reduce the temperature in health). These symptoms may terminate fatally by its paralysing action upon the respiration, though it probably requires an enormous dose of the pure acid or its salts to bring about such an issue.

Charteris' researches proved that these symptoms were mainly owing to impurities present in the acid.

Salicylic acid is excreted by the saliva and perspiration, and appears in the urine soon after administration, and various theories are held as to its condition in the blood, some holding that it exists there as the sodium salt; others that it becomes an albuminate; while Binz believes that the sodium salt is decomposed in the blood by the carbonic acid, and acts there as salicylic acid. Latham claims to have proved that the acid is changed into salicyluric acid and prevents the formation of uric acid in the system.

Haig has pointed out the utility of salicylates in preventing the accumulation of uric acid in uric acid diseases, and thus explains their value in *migraine* and *epilepsy* and in *gout*, especially in preventing attacks of gout.

It is in *acute rheumatism* that this drug and its soda salt give best results, the temperature is reduced generally within 24 hours. Often pain and temperature are most markedly diminished in 12 hours.

30 grs. of salicylic acid, or salicylate of sodium, in half an ounce of any infusion or in water every two hours for 3, 4, or 6 doses, as the severity of the pain and height of the fever heat indicate, will be found the best practice to adopt. Profuse sweating will generally follow after each dose.

Often patients express relief after the first or second dose, and it is not unusual to have a fall of 3 to 5 degrees at the end of 24 or 48 hours, or a total cessation of *all* the symptoms of the disease. The writer has seen equally satisfactory results follow ½ oz. doses in the horse. The drug acts upon the thermic centres, and the fall in the fever heat is not the result of the sweating, but is owing to diminished metabolism and to its power in destroying the material poison which produces the fever.

It is affirmed that the chances of *heart* complications are lessened and that the course of the disease is cut short by this treatment. Pain and fever return if it be withheld, but will yield again on its administration, and the drug must be given in diminished doses for at least ten days after the fever has disappeared. Latham holds that it is decidedly curative, but he insists upon the use of the pure acid obtained from the wintergreen, and points to the absence of the physiological effects of the drug as long as the rheumatic poison circulates in the blood, even when large doses are being administered.

In the *hyperpyrexia* of acute rheumatism it is not safe to trust to the antipyretic virtues of either salicylic acid or quinine; the cold bath should be employed. Maclagan found the cerebral symptoms produced by large doses of salicylic acid to disappear on the substitution of salicin for the acid.

For the high temperatures in other diseases (typhoid fever, scarlatina, pneumonia, &c.), this remedy has been found useful, but in no other affection save in rheumatism does it supersede quinine.

It is a cholagogue, and increases the amount and fluidity of the bile, and may be given in cases of *gall-stone*.

It is recommended in small doses to relieve *headache*, and in larger doses in *phlegmasia dolens*, *neuralgia*, and *lumbago*. Ringer finds it the best remedy for *sciatica*. It has emmenagogue properties and it may excite abortion.

Acid. Sulphuric.—For the astringent, tonic, and caustic properties of this remedy, see under Acid. Hydrochloricum. It should be remembered that it is valuable as an astringent only in bleeding from *mucous* surfaces.

Acid. Sulphurosum destroys the lower forms of life, both animal and vegetable. Hence it is useful in *parasitic skin diseases*, applied diluted with an equal bulk of glycerin; and internally in *pyrosis* and *fermentative conditions* of the *stomach*, depending upon the existence of dilatation or of *sarcinæ*. It has been occasionally vaunted as a remedy in *zymotic diseases*. It should be given in doses of ½ to 1 dr. freely diluted. It has been used as a spray in *laryngeal phthisis*.

Acid. Tannicum is fully discussed under Acid. Gallicum.

Acid. Tartaricum is identical in therapeutic action with Acid. Citric. (which see).

Aconite produces paralysis of the sensory terminals, and causes death by paralysing the respiratory centre or depressing the heart without affecting the cerebral faculties. Before this event takes place various alterations in the sensory and motor apparatus occur. A feeling of tingling occurs throughout

the body, beginning in the most sensitive parts, as the tongue and finger tips, and extending gradually to the least sensitive, and the terminations of the motor as well as sensory nerves appear to be irritated and then paralysed. There is great depression of the entire nervous system with diminished sensibility and loss of power of all the nerves of the spine and medulla. The pupils oscillate between contraction and dilatation, finally remaining widely dilated. The temperature and blood pressure fall, vomiting and convulsions generally appearing before death, which results from cessation of respiration. The muscles do not lose their excitability.

It is chiefly on account of its distinct sedative action on the heart that aconite is useful, moderate doses, as pointed out by Ringer, reducing the pulse to 40 beats in the minute, and lowering the respiration. He explains its action on the ground of its paralysing all nitrogenous tissue, and thus affecting the ganglia, nerves, and muscle of the heart. Following the reduction of the pulse in febrile conditions, the heat of the body falls steadily, and the skin keeps moist, and the urine is increased, aconite acting as a diaphoretic and diuretic, though the sweating does not account for the reduction of temperature.

These effects produced by aconite have led to its administration in the treatment of inflammations—as *pneumonia*, *peritonitis*, *pleuritis*, *rheumatism*, *and erysipelas*—some authorities going so far as believing that if the remedy is administered sufficiently early, the inflammation or fever is often prevented. It seems to be especially useful in *acute throat affections*. It should be given in small doses—2 minims of the tincture every 15 minutes for six or eight doses, then every two or three hours, and kept up while the thermometer registers above 100°F. Aconite is found very useful in *neuralgia* of the fifth nerve, and it increases the efficacy of quinine in most neuralgic conditions. Success has followed its administration in the vomiting of *pregnancy*. Externally it paralyses the sensory nerves, causing tingling when applied to the skin or tongue, and thus it often relieves *pain*, especially when rubbed in, in the form of unguentum aconitinæ, over the course of the affected nerve, or used as a liniment in *rheumatism*, *sciatica*, *lumbago*, &c.

Adeps, Adeps Benzoatus, and Adeps Lanæ are used solely as external emollient applications, affording a uniformly soft and unirritating base for the preparation of ointments containing more active substances. The benzoin is added to resist the putrefactive changes to which lard is so liable. Lanoline is readily absorbed by the skin, but it is very doubtful if it assists the absorption of alkaloids or other active drugs. It forms an excellent basis for ointments, and possesses the property of absorbing water to a surprising extent; it is stable, bland,

unirritating, and antiseptic. Its stickiness is overcome by mixing a little lard or vaseline with it.

Æther is used in medicine with three different intentions—1. As a *local anæsthetic*, thrown in the form of spray upon the skin or gum, when the reduction of temperature caused by its rapid evaporation becomes so great as to freeze the part, depriving it of all sensibility, relieving superficial neuralgia, and permitting the performance of minor cutting operations or the extraction of teeth, and easing the lightning pains of *ataxia*. The ether used for this purpose is the official "Æther Purificatus." 2. It is administered *internally* in moderate doses; when it reaches the stomach it stimulates its movements, increases the gastric secretion, expels flatus, and acts as a powerful diffusible stimulant and narcotic, like alcohol; it was consumed largely in some parts of Ireland as a substitute for whiskey. It is antispasmodic, and is useful in *bronchitic asthma*, in doses of ½ to 1 dr. In emergencies, as in *syncope*, *hæmorrhage*, *angina*, &c., and in *uræmic dyspnœa*, where a rapid stimulant is demanded, it may be injected hypodermically. Durande's remedy for the solution of gall-stones was a mixture of turpentine and ether. 3. It is *inhaled* to produce general anæsthesia, affecting first the cerebrum, then the sensory, and next the motor centres of the cord, next the sensory, and finally the motor centres in the medulla. It is now held to be safer than chloroform, having a stimulating action on the heart and vaso-motor centre; when death occurs, which is rare, it is owing to the paralysis of the respiratory apparatus. It is, on the other hand, more disagreeable and more tedious, and sometimes produces bronchial irritation, and is more liable to be followed by vomiting.

Pure anhydrous washed ether S.G. ·720 is best for inhalation; methylated ether S.G. ·735 answers, however, perfectly well. It may be given, poured upon a sponge, in any form of inhaler which fits the face, 1 oz. being poured on at first, and kept up till symptoms of insensibility show themselves. The vapour should be administered in as concentrated a form as possible. If the sponge be warmed, by wringing thoroughly out of hot water, the effect is sooner produced. The writer has used a pint and a half in one instance before insensibility supervened. It can be administered in conjunction with nitrous oxide, which may be used to produce insensibility, which can afterwards be kept up for a considerable time with ether, or it may be mixed with chloroform as in the A.C.E. Mixture. The temperature of the body falls considerably in prolonged etherization. The danger of the vapour catching fire must never be forgotten.

Vedd injects 5–10 minims of pure ether into *wens* frequently, and in a fortnight finds their contents liquid; he then makes an incision, after which they shrivel up.

Æther Acetic. resembles ether in action, only it is more agreeable and milder, and acts as a mild antispasmodic and diaphoretic in doses of half a tea-spoonful in sweetened water or sherry. Hoffmann's Anodyne possesses similar qualities.

Æther Nitrous—as found in the Spirit. Æther. Nitrosi—though regarded by many as a domestic remedy, is a very efficient and agreeable diaphoretic or diuretic, especially useful in *dropsies* in the debilitated. It possesses powerful narcotic properties like ether, when given in large doses.

It is invaluable in all *febrile affections of childhood* characterised by a hot skin; and in full doses, 12 or 15 minims for a child one year old, it soothes the irritation of *delayed dentition* better than any other safe remedy. For a child 1 year old—

℞. *Spirit. Æther. Nit.* ℥iiss.
Aquæ Ammon. Acet. ℥iv.
Syr. Aurantii Fl. ℥iv.
Aquæ Anethi ad ℥ii. *Misce.*

Ft. mistura. Capiat ℥j. *secundis horis.*

Prof. Leech has drawn attention to its value in reducing arterial tension, like nitrite of amyl and other nitrites, and he has shown, contrary to what might be expected, that its influence upon the circulation is of considerable duration.

Alcohol Absolutum is ethyl hydroxide with not more than 1 per cent. of water. Though the various alcoholic liquids are introduced into the B.P. for pharmaceutical operations chiefly, and not for their therapeutical properties, still the student must have a clear knowledge of the action of alcohol.

The popular term of "Stimulants," as applied to the various preparations containing alcohol, is very apt to mislead. In full doses alcohol should be regarded as a true narcotic, like chloroform, ether, or, in some respects, opium. Narcotics at first cause a period of stimulation or excitement, afterwards followed by sleep and coma; and alcohol differs from the substances just mentioned only in degree, its period of excitement being longer.

Small doses increase the flow of saliva and gastric juice, improving the appetite and digestion, augment the force of the heart, dilate the capillaries of the skin, and increase the mental activity—probably by dilating the cerebral vessels. Poisonous doses at first stimulate and then paralyse the nerve centres in the inverse order of their development, beginning with the higher mental or emotional centres, and proceeding in order to the lowest, soon destroying reflex action, producing profound

coma, dilated pupils, pallor of the skin, feeble pulse, a reduced temperature, embarrassed respiration, and, finally, death from paralysis of the respiratory or cardiac centres.

By hindering or lessening oxidation, poisonous doses reduce the temperature from 5 to 10 or more degrees F., and often small doses cause it to fall half a degree; this effect of small doses is not constant, and is not met with in those having become accustomed to its prolonged or intemperate use. Brunton has clearly shown that the early symptoms are owing to the action of the alcohol upon the vascular system by causing dilatation of the superficial vessels, and allowing the great sheet of cutaneous capillaries to cool the blood by transmission and radiation. When the surrounding air is *very cold*, these vessels, which ordinarily contract and prevent reduction of temperature, dilate to such an extent under alcohol as to cause the patient's death speedily by loss of heat in the arctic climates. When given in small doses it seems certain that a considerable amount disappears in the system, and is used up as a food like sugar, producing vital energy and heat. Binz states that alcohol, with the exception of a minute fraction, is completely oxidised in the organism, acting as a fuel; the principal result being a great saving of albumen.

Alcohol is given very freely by many in *fevers* and in *acute diseases*, some believing in its value as a true stimulant to the vascular and nervous systems; others maintain that by lessening oxidation it retards metabolism and saves tissue waste, others believing only in its powers of reducing temperature. Elaborate directions are given for its exhibition in such cases, some authorities relying upon signs of failure in the heart and general circulation, others looking for indications from the exhausted nervous system. (See the Author's "Dictionary of Treatment," page 928, for the rules of its exhibition in fevers). Most authorities would probably agree (1) that alcohol is not necessary at all in the *majority* of cases; (2) that often unpromising cases pull through without it; (3) that in severe cases it cannot be safely withheld from those habituated to it; (4) that occasionally, by the use of alcohol, life may be saved which would otherwise be lost; and (5) that it is rarely needed in the very large doses prescribed by some; 8 to 10 ozs. whiskey may be regarded as representing a liberal daily allowance.

One large dose of alcohol at bed-time is a good narcotic in very many diseases, if the patient has been a stranger to the drug. In sleeplessness from overwork, neuralgia, &c., its value is apparent; and, moreover, the danger of the patient becoming the victim of intemperance (a danger never to be lost sight of) is reduced to a minimum when given in one large dose, like a draught of laudanum or chloral, after his retiring to bed. It should be given made in punch; and whiskey is the best form of

alcohol for this purpose (℥iiss). In many inflammatory diseases the addition of 30 grs. of nitre is an improvement. The effects are not always in proportion to the percentage of alcohol contained in wines and spirits, since the subtle ethers, which develop as the liquid becomes aged, produce characteristic effects, and the impurities often present play an important part.

Brandy, Whiskey, Gin, and Rum contain about 50 per cent. of alcohol ; Port Wine, 16 to 17 ; Sherry, 15 to 16 ; Madeira, 14 to 15 ; Claret, 5 to 7 ; Porter (bottled) and Ale (bottled), 5 to 6.

Alcohol must be administered with great caution where the kidneys are diseased, and in all cases of chronic functional nervous disease, as in hysteria.

Externally, spirit is used as a dressing. The ordinary " spirit lotion " is made by adding 1 part of the official Spt. Rect. to 3 of water, or equal parts of whiskey and water, and so constituted may be used as an evaporating lotion, when applied to any part on lint, and the vapour permitted to escape freely. It thus cools the part, and by directly abstracting heat it modifies inflammatory action. When spirit lotion is applied on lint, and covered in with oiled silk, so that its vapour cannot escape, then it acts like a mild, stimulating poultice, possessing marked *antiseptic* properties. Strong solutions harden the skin and tissues, and are useful in preventing *bed-sores*.

Aloe Barbadensis and Aloe Socotrina are cathartic, chiefly acting on the large intestine, especially on its lower half, producing—in doses of 2 to 4 grs., after about 12 hours—copious softened evacuations, generally accompanied by some griping. It produces its effects when sprinkled over a blistered surface, or injected into the blood, probably by being eliminated by the mucous membrane of the colon, which it stimulates to increased action. It has a decided stimulating effect upon the liver, and increases the quantity of bile, at the same time acting upon the duodenum, but it only acts as a purgative when bile is present in the duodenum or intestines. Very large doses cause watery motions by increasing the intestinal secretion. Very small doses, as $\frac{1}{8}$ to $\frac{1}{4}$ gr., increase the appetite and give tone to the stomach, acting like other vegetable bitters.

The effect of this drug depends more upon the state of the bowels than upon its dose. 2 or 3 grains will be found enough for ordinary results, and, if followed in about 10 hours by a mild saline, will prove a very effective cathartic.

It is in *chronic constipation* that aloes is most used, and 1 gr. in a dinner pill, or $\frac{1}{2}$ gr. with nux vomica, will give good results. Spender's pill consists of 1 gr. watery extract with 2 grs. sulphate of iron. The use of aloes is not followed by constipation, nor is there much necessity for the dose being gradually increased as with other cathartics. It is of value in

amenorrhœa, being supposed to excite the uterus from its proximity to the rectum, but for this purpose it should be ordered with iron about the expected time of the delayed menstrual appearance. In small doses it relieves, but often in large doses aggravates *hæmorrhoids*, and should not be given in pregnancy or inflammatory conditions of the rectum or pelvic organs. The watery extract of aloes is the best form for administration, and it is of it that the above doses are given; its effects are increased by the addition of a bitter.

Aloin should be given in about half the above doses. Sir Andrew Clark's pill for *chronic constipation*, which should be taken before the last meal of the day, consists of ½ gr. each Aloin, Ext. Nux Vomica, Sulphate of Iron, Myrrh, and Soap. Aloin may be combined with extract of cascara advantageously.

The Compound Decoction of Aloes gives good results in many intestinal complaints, and the writer has found surprising effects from it in obstinate *diarrhœa* in children and adults; cases having been observed to resist all treatment, both astringent and eliminatory, have yielded to a few 1 to 2 oz. doses, which seem to possess some alterative action on the mucous membrane, often causing in 6 hours a soft solid motion where watery evacuations have been the rule for many days. It is, however, a most unreliable purgative—1 oz. occasionally purging at one time and constipating the next.

Alum is an astringent, causing coagulation of albumen and gelatin, and condensation of tissue and diminution of the calibre of the vessels. Externally it is powerfully styptic, and the *dried* powder is an escharotic, destroying *granulations* and *warty growths*. It is now generally believed that the astringent action of alum is a purely local one, and that it has little effect in distant hæmorrhages, but it will check gastric bleeding and the hæmorrhage of typhoid fever. In large repeated doses (of 1 dr.) it is emetic, and combined with opium, it *purges* gently in *painters' colic*, and is a remedy of great value in the treatment of *lead poisoning*, and it has been vaunted as one of the myriad specifics for *pertussis*.

4 to 8 grs. in 1 oz. water cure purulent *ophthalmia* of infants, when poured into the eye every hour, unless it is of gonorrhœal origin; but owing to alum possessing a solvent action on the corneal cement it may cause perforation, and should be used with caution, and it should not be used if there is a breach of surface; ½ oz. to 20 makes a valuable gargle for *relaxed throat*, a lotion for secreting *wounds*, and an injection in *gonorrhœa* and *leucorrhœa*. It has been found beneficial in membranous *croup*, and insufflation of the powder is useful in *chronic catarrh* and *nasal discharge*. The glycerin is a valuable local application to *enlarged tonsils*.

R.

Glycerini Aluminis ℥j.
Glycerini Acid. Carbol. ℥iii. *Misce.*

Fiat applicatio. Signa—"To be brushed twice a day over the enlarged tonsils."

2 drs. Tinct. Iodi may be substituted for the carbolic glycerin.

Ammoniacum is a stimulating expectorant which has fallen into disuse, but which is of great value in assisting the *aged* and *emphysematous* in getting up with greater ease the tough, viscid secretion of the chronically inflamed mucous membrane. Some of its constituents are excreted by the membrane, depriving the secretion of its adhesiveness. Long experience of its effects in a large infirmary of *aged* invalids convinces the writer that in some way it greatly facilitates expectoration, and assists *wheezing*, in doses of 10 grs. to ½ dr., rubbed into an emulsion with warm water. Larger doses act as a purgative; and externally it is a mild irritant, the plaster often bringing out an eruption on the skin.

Ammonia, when applied externally, is a rubefacient or vesicant. A small blister may be produced in a few minutes by laying a piece of lint, soaked in the strong solution, on the skin, and rapidly covering it with a watch-glass. Its vapour, applied to the nasal membrane and respiratory tract, acts as a powerful irritant and stimulant, by reflex action raising the blood pressure throughout the body, and is useful in *syncope* and conditions arising from *shock*. Internally, free ammonia, or its carbonate, acts as a powerful, diffusible stimulant, directly exciting the heart, and adding temporary tone to the circulatory and nervous systems; hence, in cases of *sudden depression* in *chloroform poisoning* and in *desperate exhaustion*, a drachm of the dilute liquid, mixed with twice its bulk of water, should be injected into a vein. Its action being the same when thrown into a vein or swallowed, shows that it is not likely that it is neutralised before absorption (perhaps owing to its high diffusive power), and it probably acts directly on the cardiac nerves, and afterwards on the entire nervous system, and is partly eliminated by the bronchial mucous membrane, thinning its viscid secretion. It is converted into urea in the blood, and some of it may be oxidised and appear as nitric acid in the urine.

Rossbach found that a *very weak* solution of ammonia painted over the mucous membrane of the trachea in a living animal, caused a decided and large injection of the entire surface, and resulted in an increase of the mucous secretion. Strong

solutions caused excessive hyperæmia and secretion, and finally a croupous exudation on the surface. Other alkalies produced very different results.

It is also alkaline or antacid, neutralising in the stomach any excessive quantity of acid or irritating gastric juice. It slightly increases but does not diminish the acidity of the urine, and differs from the alkalies—potassium, sodium, and lithium—by first markedly *stimulating the spinal cord* (in poisonous doses) and causing tetanic convulsions. The ammonia salts act as muscle poisons.

It should be injected where there is strong reason for supposing that a *clot of blood* has formed in the heart or any of the great vessels, as it aids its solution.

Carbonate of Ammonium acts like the free gas. It is emetic and purgative in large doses ; and in quantities of about 8 grs., diluted freely, acts as a most efficient stimulating expectorant, and general diffusible stimulant in all prostrating febrile conditions, its administration in *measles* and *scarlatina* being followed sometimes by most satisfactory results, even reducing the temperature. It is just possible it acts by destroying the morbid poison in these cases, as it does in *wasp stings* and *insect bites* when applied locally. It is not admissible in typhoid states with ammoniacal breath. The utility of its injection in *snake bites* is doubtful.

Acetate of Ammonium Solution, or Spirit of Mindererus, acts, after absorption, upon the skin, causing profuse diaphoresis, and is especially useful in all the *feverish conditions* of childhood. Its action will concentrate upon the kidneys if the patient's skin be kept cool. It possesses the curious power, in wine-glassful doses, of counteracting the immediate effects of *drunkenness*, or, in emergency, a tea-spoonful of the carbonate in a glass of vinegar acts equally well.

A mixture containing 2 ozs. of acetate of ammonium solution, 2 drs. of acetate of potassium, 4 drs. of spirit of nitre and camphor water, with a little syrup, to 8 ozs., affords the most satisfactory and harmless diaphoretic, or febrifuge combination, in passing *febrile conditions*, or while awaiting a definite diagnosis in the more serious feverish states. The solution of the citrate has the same action. (See R. on page 319).

Benzoate of Ammonium is a diuretic, acting like benzoic acid and, like it, passing out as hippuric acid in the urine. It is more active than the acid. Dose—10 to 20 grs. in water.

Bromide of Ammonium resembles the corresponding potassium salt in action. (See under Bromum). It is useful in *whooping-cough*, adding to its antispasmodic an expectorant action, and possessing sedative influence over the mucous membrane of the pharynx and larynx. The writer has found it in hospital

practice the best routine remedy for this disorder in children, combined with expectorants, like hippo and squill. It must, however, be given freely; a child one year old may get 3 grs., or in bad cases it may be pushed till drowsiness and marked sedative effects are produced.

Chloride of Ammonium is a useful expectorant when taken internally, and is most valuable when sucked in the mouth in small pieces, or, more elegantly, in tablets, one of which, placed in the hollow above the last upper molar between the cheek and the gum, where it will take above an hour sometimes to dissolve, will be followed by a free, painless, and often silent expectoration of mucus and checking of the cough. It often permits the subjects of *bronchial irritation* to freely expose themselves to the cold, damp, and even foggy atmosphere of a severe winter.

The writer proposes the term Ciliary Excitants for remedies which appear to have this effect upon the expectoration.

In *catarrh*, after the acute stage, they will be found very useful, and they run no risk of upsetting the digestion. It becomes a difficult question as to the way in which these substances act. One thing, however, is certain, that it is not by absorption, since the same effect, though in a *much less* degree, may sometimes be produced by sucking substances absolutely insoluble, as bits of glass, rubber, &c., and some of the soluble remedies produce no effect when swallowed in mixtures even in large doses, so that one is forced to the conclusion that they act by reflex action. Two conditions appear necessary to produce a *decided* effect upon the secretion, viz.—the substance should be *soluble* in the fluids of the mouth, and should produce an impression upon the nerves of taste different from that continually being caused by food. Sugar, for instance, will not affect the secretion, but, if flavoured with an essential oil, it appears to possess some power.

The impression produced upon the terminal filaments of the glosso-pharyngeal, or the lingual branch of the fifth nerve, is conveyed to the centre in the medulla, whence it probably is communicated by branches of the vagus, or through the sympathetic system, to the mucous membrane, or bronchus, in which it may effect nutritive, secretory, or motor changes.

As will be explained in speaking of some expectorants, the probability of any remedy acting as an expectorant and increasing the quantity of bronchial secretion without influencing the cilia is slight. The cilia are parts of the same cell, the office of which is to secrete the mucus, and it is hardly in keeping with our present knowledge to suppose that the functional activity of the cells would be increased without influencing their prolongations—the cilia—even though the process of secretion should end in the death of the cell.

Chloride of Ammonium was found by Anstie to be useful in *neuralgia*, and to cut short the course of *migraine* attacks, in doses of 20 grains. It is useful in *chronic hepatic congestion*; in 20 gr. doses it always induces free diaphoresis, increases the flow of urine, diminishes portal congestion by depleting the congested abdominal viscera, and relieves hepatic pain. It relieves the vomiting in malignant disease of the stomach, and is an alterative in chronic *rheumatism* and *sciatica*.

Various forms of Chloride of Ammonium inhalers, in which the nascent salt is brought into contact with the diseased spot, are used in throat affections.

Phosphate of Ammonium is a diuretic, and is said to decompose the insoluble urate of sodium in the blood, forming urate of ammonium and phosphate of sodium, and is highly recommended in cases of *uric acid diathesis*.

Spirit of Ammonia (Aromatic) and *Liquor Ammoniæ* afford, the former especially, agreeable methods of administering ammonia. They should be always freely diluted.

Ammonia acts as a caustic or irritant poison when swallowed, the free gas causing serious laryngeal trouble (possibly requiring tracheotomy), and violent gastric irritation, forbidding the use of the stomach-pump.

Amygdala — the sweet almond — is sometimes used in medicine on account of its mild, demulcent effect when directly applied to irritated mucous membranes, but it is, however, chiefly employed as an agreeable vehicle for more potent remedies, or made into bread as a food for *diabetics*. The oil *expressed* from either variety is a bland, soothing application in *inflammatory skin affections*.

Bitter almonds are more active, containing, in addition to emulsin, which is also found in the sweet variety, a principle called amygdalin. These two substances, when brought together in presence of water, act upon each other, the amygdalin splitting into two new bodies—Prussic acid and volatile oil of almonds—the former of which, being a deadly poison, accounts for deaths after eating bitter almonds; and it explains the action of a lotion of bitter almond emulsion in stopping the itch of various skin affections.

Amyl Nitris—After the inhalation of 5 minims of this drug, the pulse is quickened, or sometimes doubled, the arteries dilate, the carotid throbs, and the face flushes, and there is great general relaxation of the arterioles, with diminished blood pressure. If a poisonous dose be administered to an animal, there appear signs of paralysis of the motor and sensory centres in the *spinal cord*, the quickened heart and respiration become slower, and may finally cease from paralysis; tetanic cerebral convulsions occasionally

arise, the temperature falls, and the blood pressure becomes *nil;* the blood assumes a *characteristic chocolate colour* from the formation of methæmoglobin, which is deoxidised with greater difficulty than hæmoglobin itself. The dilatation of the arterioles is caused by either paralysis of their muscular coats or of the local vaso-motor ganglia.

Brunton *anticipated* its efficacy in *angina pectoris*, in which disease it has proved a blessing, lessening, when a few drops are inhaled, the arterial spasm, and in the great majority of cases producing relief from the agony of the attack. The capsules introduced and prepared by Martindale, and covered with silk, into which the amyl escapes when the capsule is broken between the thumb and fingers, afford the safest, most elegant, and rapid means for the administration of the drug. It is a safe remedy, and may be inhaled directly out of a phial, or sprinkled on a handkerchief, or swallowed on sugar.

It has been used with success in *epilepsy* while the attack is coming on, in *asthma*, *neuralgia*, *eclampsia*, *migraine*, and *sea sickness*. It has been used to combat the heart failure in impending death under the influence of chloroform. Through its action upon the cord, it diminishes reflex excitability, and in the case of animals, sugar appears in the urine.

It increases the elimination of uric acid in the urine, and has been used in *gout* with benefit.

Ringer directs attention to the extreme susceptibility of some patients to its action, and the writer knows a healthy man who has several times been inconvenienced by passing a building where the drug is frequently used in a varnish for pictures and show-cards.

Amylum—Starch—is nutritious; but it is for its bland, unirritating qualities, when applied externally or in enema, that it has been used in medicine. The powder dusted over *erysipelatous* or *excoriated surfaces* acts as a soothing coating, shielding the part from the action of the air or irritating secretions. Occasionally the preparation with glycerin irritates the skin. Starch is an antidote for iodine.

Anethum and Anisum—Dill, Anise, Coriander, Fennel, and Caraway are identical in action. They are powerful antiseptics. They are in large doses general stimulants, and are used in medicine as carminatives to relieve the *griping of purgatives*, and the pain of *colic* and *flatus* in children, for which purpose anise is most used. They probably act in these latter cases as antispasmodics by reflex action; in small doses they increase the secretion of gastric juice, and all possess feeble expectorant powers by stimulating the respiratory membrane during elimination by the breath. In full doses they have weak narcotic powers.

Anthemidis Flores—Chamomile—is a stomachic bitter, improving the appetite, and indirectly aiding digestion by increasing the vascularity of the gastric mucous membrane ; in larger doses, especially if warm, the infusion is *emetic*. Its chief use is in *atonic dyspepsia*. Externally, a warm fomentation is a popular remedy in the early stage of inflammations and sprains. The oil is a general stimulant and antispasmodic in 5 minim doses. It diminishes reflex excitability, and has been found useful in *sick headache*.

Dutt has obtained striking results in *diarrhœa infantum* with the tincture of German Chamomile *(C. Matricaria)* U.S.P.

Antimonium—The tartrate is the salt generally used in medicine on account of its greater solubility and activity.

Externally, it reddens the skin, and brings out an eruption of pustules somewhat like *smallpox*. Its counter-irritant action is uncertain, and liable to be followed by scars.

In large doses it is a violent irritant poison, producing vomiting, inflammation of the digestive tract, finally great prostration and paralysis of the motor and sensory nerves from its direct action on the *cord*. The heart is paralysed, the arterial pressure falls finally to *nil*, and the respirations become reduced.

In medicinal doses its action varies with the quantity administered. In $\frac{1}{6}$ gr. doses it slightly reduces the force of the pulse by its direct effect upon the heart, and acts as a diaphoretic, causing free perspiration, probably by affecting the nerve supply of the sweat glands, and it increases the secretion of the bronchial mucus. The latter effect is one of the most important of the drug, and places it in the first rank of true expectorants. It would appear that the same change occurs in the mucous membrane, as is seen in the skin, and this is especially likely, as we know that the gastric and intestinal mucous secretions are likewise increased. It may thus be said to cause the bronchial surface to sweat. In slightly larger doses—$\frac{1}{4}$ to $\frac{1}{2}$ gr.—nausea is excited and the heart's action is diminished, antimony acting as a cardiac sedative ; the pulse gets soft and weak, arterial tension is lowered, and general relaxation of all muscular structures supervenes ; and if the dose is repeated, or 1 dose of 1 to 3 grs. is given, active vomiting takes place, with great depression and intensification of the former mentioned effects.

Its emetic action follows either after it is swallowed or injected into a vein, and experiment shows that it acts by *directly* influencing the vomiting centre, and also by irritating the *terminal filaments* of the pneumogastric and exciting *reflex action*. If introduced into the stomach, a much *smaller* dose of the drug will produce vomiting than if injected into a vein, and the smaller dose by the mouth will act *quicker* than the larger dose by the veins ; this goes to prove that its local action is more important

in emesis than its effects upon the vomiting centre, notwithstanding that Majendie induced vomiting by injecting it into an animal after the removal of the stomach. Ringer explains the action of antimony as that of a protoplasmic poison paralysing all nitrogenous tissues, like arsenic, aconite, and Prussic acid. It weakens the heart by affecting the ganglia, nerves, and muscle. It is eliminated by the glands of the stomach, intestines, and bronchi, and the urine and bile, and affects the cells in the skin like arsenic when given in poisonous doses to frogs, only its action extends deeper than that of arsenic.

Such, then, being the *physiological* action of tartar emetic, its *therapeutic action*, or the effects which it produces in diseased conditions, can be for the most part anticipated from this. Thus, in febrile conditions, with a hot, dry skin, its diaphoretic action will be called to our aid; in bronchial affections, with tenacious adhesive secretion, it produces great benefit; whilst in acute inflammations like *pneumonia* and *pleuritis*, with high, bounding pulse, great fever, and vascular excitement, it is invaluable from its cardiac sedative action.

In acute inflammatory affections of the respiratory tract, especially in *croup* and *laryngeal spasmodic diseases*, it is our sheet anchor, allaying spasm, reducing fever, and directly cutting short the progress of the disease.

The following may be given in spasmodic croup to a child 1 year old:—

℞. *Antim. Tart. gr.* i.
Vini Ipecac. ℥iv.
Syrupi et Aquæ ad ℥iii. *Misce.*

Signa—"*A tea-spoonful every fifteen minutes till vomiting is produced; then every 1, 2, or 3 hours as required.*"

It should be given with great caution in *diphtheria*. It is called an antiphlogistic from its power of combating *acute inflammations* of a sthenic type, and it is probable that its action in such cases is only what can be accounted for by its effects upon the heart's force and frequency, and the diminution in the respiratory movements and vascular tension.

In the violent delirium of *fevers*, Graves employed it in ¼ gr. doses with great benefit, combined with as much opium, every hour or two. In *delirium tremens*, when opium failed totally to produce any sleep, the writer has seen it speedily act when ¼ to ½ gr. of this salt was added.

In the *acute bronchial affections of childhood*, antimony continues to be the best remedy we possess. Combined with hippo, or given alone, in the form of the wine, ½ to 1 tea-spoonful is an emetic for a child 1 year old, and 5 minims every hour afterwards keep up the expectorant effect; but the dose can be easily regulated by keeping the little patient on the border-land of vomiting. Owing to the slowness of its action and the great prostration which follows, it is not indicated in poisoning.

Tartar emetic was formerly employed to produce muscular relaxation in *dislocations* and *hernia*, a practice which has melted away before the advance of chloroform. It is still used in *rigidity of the os*, and is valuable in *acute synovitis*. Great tolerance of the drug may be observed in feverish conditions, probably owing to the toxic effect of the poison (causing the *fever*) on the nerve centres.

Antimonial or James's Powder, the active principle of which is oxide of antimony, possesses most of the properties of the tartrate in a feeble degree. It is used in 5 gr. doses in febrile conditions for its mild diaphoretic qualities.

Chloride of Antimony is a powerful caustic and corrosive liquid, only used externally. It has ceased to be official.

Sulphurated Antimony possesses all the powers of the tartrate, only in a less degree. It has *alterative* properties, which have gained for it some reputation in *syphilis*, when given with calomel in Plummer's pill. It is most uncertain in action on account of its insolubility.

Apomorphine possesses none of the narcotic properties of morphine. When given by mouth or injected hypodermically it produces vomiting, and very *much less* is required by this latter method than if administered by the mouth. It acts *directly* upon the vomiting centre, and is much more rapid than tartar emetic, and its action is not followed by nausea or prostration, hence it is the most efficacious emetic known in cases of poisoning, especially in cases of narcotic poisoning when the power of swallowing is lost; the dose hypodermically *should never exceed* $\frac{1}{10}$ *grain*. It has little, if any, effect upon the peripheral nerves in the stomach. It stimulates and then paralyses the motor, cardiac, and respiratory centres and muscular fibre, without affecting motor or sensory nerves.

Apomorphine is invaluable as an expectorant. Rossbach, by exposing the interior of the trachea in a living animal, and watching the effect of various substances, studied the action of expectorant remedies from an entirely original point of view. He found that *emetine*, *apomorphine*, and *pilocarpine* produced a rapid and profuse pouring out of the mucous secretion, which, especially in the case of the latter drug, was most abundant and liquid, and filled the tubes almost to suffocation. He demonstrated that,

contrary to the accepted opinion, this great *hypersecretion* was not preceded or accompanied by *hyperæmia* of the membrane; these drugs were proved by a severance of all the laryngeal nerves, and by a ligaturing of the trachea itself, to act in no *centric* or *indirect* way, but to exert their influence by *acting directly upon the peripheral endings* of the gland-nerves, the gland cells, or the minute ganglia, to which they were carried by the blood stream.

Apomorphine was found to give rather better results than *emetine*, while the constitutional effects of *pilocarpine* prevented its use as an expectorant.

Rossbach states that these drugs are the prototype for expectorating patients, especially in *chronic inflammations* accompanied with dryness of the mucous membrane, wrongly called *catarrhs*, and also in *acute catarrhs* attended with very *viscid secretion.*

In the *bronchitis* and *croup* of children he convinced himself of the excellent and life-saving action of apomorphine.

He says that "it is only since I learned the excellent effects of apomorphine that I can say I really like to treat catarrhs, even of the most obstinate kind, and no longer, as before, approach the case with a sense of therapeutic powerlessness."

The writer has now used it very extensively since 1881, and can speak of it quite as strongly as the above. He has used it alone and also combined with morphia, and finds it the only drug of real value in dealing with some forms of *bronchial irritation*, caused by the inhalation of flax-dust, in operatives employed in the manufacture of linen, whilst it afforded the best results in ordinary *dry catarrhs*, and in *bronchial asthma*. It must be, however, used with caution, from its risk of depressing the heart and possibly causing œdema of the lung. $\frac{1}{8}$ gr. every 3 or 4 hours in camphor water, with or without morphia or ipecacuanha, may be given. Murrell has given 1 gr. 3 or 4 times daily without nausea resulting.

A 1 per cent. solution freely dropped into the eye will cause anæsthesia like cocaine.

Aqua—A few of the therapeutic effects of water may be mentioned, though its place in the B.P. is entirely owing to its pharmaceutical properties.

Water is of great use in fever, in the form of ice, a bit of which sucked in the mouth allays thirst by reflex action. It also, probably by reflex action, stimulates feebly the cerebral circulation; and it may increase the quantity of gastric juice before being swallowed. In *ulcers* and *irritable conditions of the stomach* it soothes by diminishing sensation, while it checks hæmorrhage by contracting the muscular tissue of the ulcerated artery.

In ½ to 1 pint doses, cold water before food in the morning acts as a mild cathartic, by adding water to the fæces, which it probably does by being alternately absorbed and eliminated again as it passes down the canal, stimulating the intestinal glands. The writer has seen perforation occur in gastric ulcer very soon after the administration of *very hot water*, a practice which has become popular in the treatment of constipation and dyspepsia, and which he believes to be dangerous, and liable to produce ulceration. Introduced into the rectum as an enema, water washes out the colon, and is the safest remedy in impacted accumulations; but to be administered properly, it should be given at about 98°, slowly injected, with the patient lying on the left side. From 3 to 8 pints can be used with safety, if not jerked up; and benefit will be found by turning the patient over gently on his right side, or on his hands and knees, or by raising the pelvis, so that the fluid gravitates along the colon to the valve, the operator pausing from time to time to allow the temporary pain or spasm to subside.

Of a different class are enemata of cold water, or of water containing castor oil, turpentine, soap, &c. Here the intention is to excite reflex contraction, which one endeavours to avoid in the former case, and a pint will be enough. Still more different are nutrient enemata, which are intended to be absorbed. They should not be more than the bulk of a few ounces, and should be of the consistence of thin arrowroot. The addition of a little laudanum assists in their retention till digestion and absorption occur.

Water, when taken in large quantity, acts as a diuretic, by washing out the kidneys and bladder, and copious draughts of warm water are emetic.

Externally, water is largely used in medicine, and its mode of action depends upon its temperature and the method of application. Bartholow states that on immersing one hand in cold water a corresponding reduction of temperature occurs in the other hand, and infers that changes in a similar way occur internally.

On immersing the body in cold or tepid water, refrigeration, especially in feverish conditions, occurs from the actual loss of animal heat, water acting as a good conductor; the vessels of the skin are caused to contract, and in the warm bath they relax. The hot bath at first acts as a powerful stimulant, but, if indulged in for too long a period, the heat of the body causes cardiac weakness, and prostration and fainting follow. The hot and warm baths, acting so thoroughly on the skin and increasing its secretion, are used to cause excretion of water and urea in *dropsies*.

Ice is largely used in surgical practice as an application to inflamed parts, as in *orchitis*, *hernia*, *head affections*, &c., acting as a sedative, diminishing the amount of blood in the part, both by direct and reflex action ; and water, iced, tepid, and cold, is used for dressing and irrigating wounds.

The following are the most common forms in which water is used externally as a remedial measure :—

The *Cold Bath*, which is water about the temperature of the air, or on an average of between 45° and 60°F., is used in *fevers*, and as a powerful tonic in various diseases of the nervous system. The tonic effects of the cold sea bath are most marked, and are, generally speaking, in proportion to the shortness of the immersion, as seen in the amount of stimulation and healthy reaction.

The *Tepid Bath* is water about 85° to 95°, also used in fevers.

The *Warm Bath* is water about 98° to 100°, and the *Hot* bath is water at 103° to 108°, used in *dropsies*, *kidney diseases*, *catarrh*, attacks of *renal* and *hepatic colic*, &c., while in the *Turkish Bath* various apartments are heated from 100° to 200°F. It is used in *secondary syphilis*, *rheumatism*, &c.

The *Sitz* resembles the *hip bath*, being a vessel in which the pelvis and hips can be immersed in water at any temperature, the remainder of the body being free. It is used in the sitting posture for *uterine ailments*, *amenorrhœa*, &c.

The *Sponge Bath* is a shallow vessel, generally of cold water, in which the patient sits or stands while the surface of the body is sponged freely over.

The *Douche* is a *sudden* application with force, of a stream of water (generally cold) to the surface of the body ; an invaluable remedy in the *coma of alcohol*, *sunstroke*, *delirium*, *insomnia*, &c. It differs from the *shower bath*, which is the impaction of a multitude of drops, or minute streams, from a height, and from *cold affusion*, which is the pouring of a liberal volume of cold water over the surface of the body, as in *fevers*, *alcoholism*, and *laryngismus*.

The *Wet-Pack*, so much used in hydropathy, consists in enveloping the naked body in a sheet wrung out of cold water, and spread flat upon a hard mattress, upon which the patient reclines, the ends of the sheet being carefully tucked in on each side, and the feet completely covered, after which several blankets are placed upon the top of the sheet. The pack lasts half an hour or more, and is followed up by friction with dry towels.

The *Hot Wet-Pack* is managed in a similar way with hot water, and resembles the various *steam* baths used in dropsies, and which may be made by boiling water with a spirit lamp

under a cane-bottomed chair, upon which the patient sits, surrounded completely, except the head, by a blanket.

The *Mustard Pack* is managed like the *Hot* pack by infusing a handful of powdered mustard in the hot water in which the sheet is immersed.

Sir J. Simpson's poor man's bath is made by filling 6 or 8 soda water bottles with hot water, drawing over each a stocking squeezed out of hot water, and placing them alongside the patient under the bed-clothes. They make a good bath in about 30 minutes.

The *Hot-air Bath* is made in a similar manner by burning a spirit lamp under a chair, or by introducing under the bed-clothes any of the spirit lamps made for the purpose. These latter are invaluable in *Bright's disease*.

Fomentations are merely local baths, or circumscribed hot packs, in which medicinal substances are generally introduced.

Cataplasms are similar applications of a semi-solid consistence, composed of various medicated ingredients.

It is in the treatment of *hyperpyrexia* where the temperature of the body rises to 106° or 108° and remains so, death being almost certain in such cases if let alone, that the judicious application of cold water saves life—as in *typhus*, and more especially in *rheumatic fever*. The patient is placed in a bath of about 98°, and cold water or ice is added till the bath cools to 70° or 60° F., watching the temperature of the patient, as indicated in the rectum. When a fall occurs of 3 to 5 or more degrees, he is removed, wiped dry, and put to bed, where the temperature continues to fall for half an hour or more. The time in the bath varies from 5 minutes to 2 hours, and it may be repeated every 2, 3, or 4 hours (if necessary) when the case is severe. The *routine* use of the cold or tepid bath in *typhoid fever*, when the temperature rises above 102°, has greatly reduced the mortality of this disease, *cold sponging* may be substituted in mild cases, or *iced compresses* may be applied.

Water at a temperature of 112° effectually checks *uterine hæmorrhage*, when injected into that organ.

Aquapuncture, or the injection of water by the ordinary hypodermic needle under the skin, or into the substance of muscles, is often followed by surprising results. Its action depends upon its nutritive effect on the nerves of the part, for pain in a superficial nerve is often at once alleviated, and it will produce this effect without causing any irritation around the puncture. Bartholow has derived good results from the injection of water into the substance of paralysed muscles.

For superficial pain 30 minims should be injected at the pained spot and frequently repeated—5 times within an hour if necessary.

Araroba (See Chrysarobin).

Argenti Nitras coagulates albumen and is a powerful corrosive poison, and when applied externally, either in the form of solid stick or mitigated caustic, it destroys the tissues, and is used to paint over exuberant granulations, its destructive effects being followed soon by an *altered action* of the parts, a result which is utilised in many chronic unhealthy inflammations, as in *cystitis* and *gonorrhœa* (1 gr. to 1 oz.), *conjunctivitis* (10 grs. to 1 oz.), *ulcers* (30 grs. to 1 oz.), and *relaxed pharyngeal catarrhs*, and *tubercular* and *other ulcerations* of the *larynx*, *pruritus*, &c. (10 grs. to 1 oz.). It destroys *tinea*, *warts*, and *chancres;* and the *poisons of rabid animals and snakes*, if applied in time. As a caustic for rabid bites the nitrate of silver is the most painful, and, according to the opinion of Roux as expressed to the writer, one of the least reliable.

Carter, in *ophthalmia*, introduces a cocaine disc into the eye, and in 10 minutes applies with a *fine* camel's-hair pencil a small quantity of a (5 to 10 grs. to 1 oz.) solution of the nitrate, confining its action, if necessary, to the region of the ulcers. With a larger brush ophthalmia neonatorum may be painlessly treated. Crédé's method of preventing this latter disease is to drop in a 2 per cent. solution after birth.

Internally, nitrate of silver acts in large doses as other corrosive poisons, causing inflammation and destruction of the gastro-intestinal mucous membrane. In addition, however, it causes marked *nervous* symptoms, as *paralysis*, *spinal convulsions*, *dyspnœa*, &c., from its action upon the centres. It has been successfully used in large doses ($\frac{1}{4}$ to 2 grs.) in *ulcer of the stomach*, with the view to cauterise or alter the character of the process going on in and around the ulcer, its use being not free from danger. In solution it has been recommended as an injection in ulceration of the rectum and colon. In *dyspepsia* and *vomiting of yeasty fluid* it often acts most beneficially. As it coagulates albumen, it possesses astringent qualities, and hence is used in *diarrhœa* depending upon ulceration ; and its effect upon the gastric nerves, in doses of 1 gr., in bread-crumb pills, is sedative. It has been given in *chronic affections of the spinal cord*, in *paraplegia*, and *locomotor ataxy*, and it often relieves, and sometimes cures *epilepsy* when bromides fail, but the great barrier to its use in such diseases is the permanent dark discoloration of the skin (argyria) which it produces. When it reaches the stomach it is precipitated by the chlorides abounding in the gastric juice, and likewise when applied to a moist surface it whitens it, owing to a film of the chloride being formed, which is afterwards changed into the black oxide.

It has been recently recommended in *purpura*, and the writer

has seen striking results in two cases from ¼ gr. doses three times a day.

℞. *Argenti Nitratis gr.* iv.
Micæ Panis (*sine Sodii Chlor.*) *gr.* xxx.
Misce.

Fiat massula et divide in pilulas xvi., *st.* i. *ter in die, ante cibos.*

Argenti Oxidum resembles closely the nitrate, except in its external effects. It is less irritating, and has been used in 1 gr. doses in *gastrodynia* and for its astringent properties in hæmorrhages, especially *menorrhagia*, and for its alterative effects upon the nerve centres, in *epilepsy*, *ataxia*, &c.

Armoracia—Horse-radish Root—when chewed, acts as a stimulant to the salivary glands, increasing their secretion—hence it is a Sialagogue. When swallowed, it increases the gastric secretion, acting as a stomachic, and after absorption it is thrown out by the kidneys, stimulating these organs in its passage—thus it is a true Diuretic. The secretion of the skin is also increased. When applied externally it is a Rubefacient, causing redness, like mustard, only less in degree.

Arnica—Externally applied, preparations of the root or flowers cause irritation of the skin, which may take on serious or even fatal inflammatory action, extending to distant parts, and simulating erysipelas or gout. Its use is contra-indicated whenever the skin is broken. ½ oz. of the tincture to 1 pint water is strong enough for ordinary use. Diluted, these preparations are said to act in such a way as to cause absorption of extravasated blood, by their effect on the absorbents of the skin, hence they are applied to *sprains* and *bruises*; most of the benefit, however, may be justly ascribed to the spirit generally used along with them. Internally, arnica has been credited with many fancied virtues. It acts as an irritant to the stomach and gullet, and produces diarrhœa, and in large doses diminishes, like aconite, the respiratory and circulatory functions; it has been recommended in *fevers* and in *delirium tremens*. It produces in poisonous doses marked nervous prostration, muscular weakness, spasmodic movements of the limbs, and collapse. It is at best an uncertain and often a dangerous remedy, and is justly falling into disuse, and should have been omitted from the new B.P.

Arsenic (See Acid. Arseniosum.)

Asafetida, after absorption, acts as a stimulating expectorant, closely resembling the onion in its power of increasing the secretion of mucus from the air passages, probably during its

excretion by this channel ; and it either blunts the sensibility of the respiratory centre, diminishing the breathlessness of *emphysema*, or, by diminishing the flatus in the digestive tube, it gives more room to the easily-overburdened lungs. It is, however, in *hysterical* ailments that it is chiefly employed, controlling the irregular and erratic nervous phenomena seen in that disease, as some suppose, by the moral influence of its disgusting and intolerable odour.

It acts as a mild purgative, and is very beneficial as an enema in *flatulent colic*. The best preparation is the Fetid Spirit of Ammonia, in ½ dr. doses.

Atropine and Belladonna when applied locally act as anodynes by lessening the sensibility of the sensory nerves. Small doses cause dryness and redness of the throat and mouth, dilated pupils and disordered vision, and sometimes a peculiar scarlet eruption. By stimulating the nerve centres, a large dose produces active brain excitement, with pleasing delirium, hallucinations, illusions, a feeling of lassitude, and eventually sleep, whilst at the same time there is paralysis of the peripheral motor nerves. The heart becomes excited and the vascular system stimulated (standing 12 feet from a patient the writer has heard the heart sounds) ; this stimulation is probably caused by the action of the atropine upon the minute inhibitory ganglia contained in the cardiac muscle, and not upon the terminals of the vagus. Ultimately the heart is paralysed, the small vessels contract, and the arterial tension is at first raised and afterwards diminished, the secretion of saliva, bronchial mucus, and sweat are stopped. At first there is forcible expulsion of urine, but soon the bladder becomes partially paralysed, the urine and urea increased, and the pupil widely dilated.

The respiratory and vaso-motor centres are stimulated by full doses, but paralysed by poisonous doses.

When dropped into the eye atropine causes marked dilatation of the pupil by paralysing the filaments of the third nerve supplying the sphincter muscle of the iris. *The action is entirely a local one.* If pain be present, it is at once relieved. There is also marked loss of accommodation, resulting from paralysis of the ciliary muscle, which fails by loss of tension to act upon the suspensory ligament, so as to cause the lens to become more spherical ; the eye is consequently focussed for distant objects.

Atropine causes mydriasis when given internally, by being carried in the blood to the eye itself, and there acting precisely as when applied locally.

Brown-Séquard recommended belladonna with the intention of contracting the small vessels supplying diseased tracts of the nervous system, as in certain forms of *spinal paralysis*,

and for a similar reason it has been employed in various *inflammations*. From its power of stopping the secretion of milk, it is of the greatest use in checking congestion and inflammation of the breast after weaning. Moreover, as it tends to prevent suppuration by its action on the white blood corpuscles, like quinine, a local application to the breast is of great value; it may be given internally at the same time. In *small* doses it increases the action of purgatives by weakening the inhibitory fibres of the splanchnic. It is recommended on this account in *constipation*, *obstruction of the bowels*, *impacted gall-stones*, *renal calculi*, and *asthma*. Harley recommends it in *kidney affections*. Both internally and locally it checks *sweating*, and is a favourite remedy in the *night sweats of phthisis*. (Ext. Bellad. Vir. gr. $\frac{1}{4}$, Zinci Oxidi gr. iii.). This pill will remove *urticaria* and *acne*.

As a *diuretic* it increases the urea in diseases threatening suppression of urine. It has a powerful effect in stopping the bronchial secretion, and has been given for the *profuse expectoration of bronchitis*. In the hands of some physicians it has been found to relieve cough and spasm of the bronchial tubes. This has not been the writer's experience, nor has he found it of benefit combined with digitalis in cardiac weakness. Old people are affected sometimes by most minute doses. From its anodyne action it is beneficial in *neuralgia*, and Anstie advocated its use in *lumbago*, *sciatica*, and *neuralgia of the pelvic organs*. Pushed almost to the extent of showing its poisonous effects, it is curative in *whooping-cough*, and children bear very large doses. It is by far the best remedy in *incontinence of urine* in children, probably by its partially paralysing the muscular coat of the bladder. It is excreted in the urine. According to Hausmann the hypodermic injection of $\frac{1}{150}$ gr. atropine will control *hæmoptysis* when ergot and all other remedies fail.

Belladonna and atropine are used as antidotes in opium poisoning. The addition of $\frac{1}{2}$ or 1 minim of atropine solution to each hypodermic dose of morphia is a wise routine practice.

For nocturnal incontinence in a child 5 years old:—

℞. *Tincturæ Belladonnæ* ℥iv.
Syrupi Limonis ℥iv.
Aquæ (or Aquam) ad ℥vi. *Misce.*
Fiat mistura, cujus capiat ℥j. *ter in die et hora somni.*

Externally, it is used on account of its anodyne properties to relieve pain in *neuralgia*, or to arrest the *suppurative process* in boils; and the plaster, in addition to relieving pain, acts by putting the region to which it is applied to some degree on the

same footing as an *internal part*, hence its value as a strapping for *enlarged glands* and superficial *joint affections*. It is useful in the form of plaster when worn over an irritable and pained heart. It should be remembered that belladonna is freely absorbed by the unbroken skin. The best application to the inflamed breast is 1 oz. green extract of belladonna, 1 dr. hot water, and 7 drs. glycerin.

Squire's Chloroform of Belladonna made by percolating the root with chloroform (1 in 1) is a powerful anodyne application.

Aurantii Cortex is a mild bitter tonic, acting on the stomach in such a way as to give it increased tone, and it feebly stimulates the appetite. It is for its flavour, which is aromatic and pleasant, that it is used in medicine.

Aurantii Flores, in the form of Aqua, are only used for their agreeable perfume and flavour, though supposed to possess hypnotic qualities.

Balsams of Peru and Tolu—These substances are of little therapeutic power; they act as stimulating expectorants, probably because they are eliminated to some extent by the bronchial mucous membrane, and, to a still less extent, by the other mucous surfaces, to which they act as feeble stimulants. Externally, the Peruvian balsam is a mild stimulating application to *sluggish ulcers*, *bed sores*, and *cracked nipples*, in which cases it is often mixed with castor oil in equal quantity. In a similar way it is a valuable parasiticide, and is a good remedy for the *itch* and for *pediculi*.

Baths (See under Aqua).

Belladonna (See Atropine).

Benzoinum—A stimulating expectorant, acting, probably, on the relaxed bronchial mucous membrane, by which some of its volatile constituents are eliminated. It possesses all the properties of its active principle, Acid. Benzoic. (which see). The compound tincture, or friar's balsam, is an invaluable antiseptic stimulating application to *ulcers and sores*, and is the best remedy for healing *tortuous sinuses* and *sinuous scrofulous tracts*, and injected (undiluted) with a fine syringe, it decomposes *fetid* secretions, and establishes healthy action in these troublesome affections. A piece of lint saturated with it is a valuable hæmostatic when applied to fresh *wounds*.

Containing benzoin, storax, and tolu, it is highly spoken of by Yeo, who has found it of great service in lessening the secretion and cough in *chronic bronchitis;* it may be prescribed with mucilage or tragacanth. (See page 35).

The vapour of the tincture has been found to cut short attacks of *catarrh* and *influenza* in a surprising way, it is said, even when

inhaled directly from the bottle containing it, or if inhaled as a fine spray from the atomiser.

Benzol is only introduced into the B.P. as a solvent for India-rubber for the preparation of Charta Sinapis.

Bismuthum — The preparations of bismuth act, when swallowed, as direct sedatives, by coming in contact with the excoriated or irritated filaments of the nerves supplied to the mucous membrane of the stomach. The insoluble salts were held to pass through the alimentary canal, but Wood has demonstrated that bismuth can be easily detected in the urine shortly after their administration, and there is not a doubt but some portion is absorbed. The residue blackens the motions like iron. Whether the sedative action on the gastric nerves is owing to mere mechanical shielding of them from irritating secretion, or to some vital change in the nerve ending, induced by contact with the bismuth, or to the antiseptic power of the drug we do not know; but ample clinical experience has proved the great value of these salts in all *painful gastric* affections, and in the cure of *dyspepsia*, *ulcer of the stomach*, and *vomiting* from various causes. They are used also in *diarrhœa* in larger doses (1 dr.), and sometimes as a cosmetic, and as a soothing application to *eczema*, *intertrigo*, *burns*, &c., and have been used as an injection in *gonorrhœa*, and in *ulceration of the rectum*. The carbonate is the most useful preparation, being antacid, and may be safely combined with opium or morphine. It is also credited with astringent properties, and it is antiseptic; poisoning has been reported from the absorption of the insoluble salts when applied in quantity as a dressing, but as a rule they are innocent in very large doses. The writer never employs the liquor, having seen it so often aggravate all the symptoms for which it was prescribed.

The recently introduced Salicylate is a valuable gastric sedative, and is frequently given in *typhoid fever*. The peculiar phosphorus-like odour of the breath observed during a course of bismuth has been shown to be caused by the metal tellurium found in impure preparations.

As an application in irritable conditions of the nasal membrane, "Ferrier's Snuff" is valuable; it consists of Subnitrate of Bismuth 3vj., Morphine Hydrochloride 2 grs., and Powdered Acacia Gum 3ii. (See the ℞. on page 313 containing bismuth.) By the addition of a little morphia it may be used in any painful gastric disease with great benefit.

Borax, when swallowed, is absorbed, and acts in the blood like an alkali or antacid, and passes through the kidneys, which it stimulates, acting thus as a diuretic. It also affects the uterus, which it causes to contract and expel its contents; hence it has

been used to *produce abortion* and to expel a *retained placenta*. Its *emmenagogue* properties, however, are uncertain, and it is for its local action that borax is generally used. Applied to a diseased *mucous membrane* it soothes pain and diminishes congestion, altering the action of the part. Its action has been in this case described as astringent, but, with our present knowledge, it seems better to confess ignorance, and call it a *local alterative*. Recently, good results have been reported in *epilepsy*, after doses of 10 to 20 grs. thrice daily.

Borax exerts a toxic power over the lower forms of life, and possesses antiseptic properties, but Boracic Acid is selected when we wish to get this effect of borax. (See Acid. Boricum.) Of all the remedies we possess, none equal it for the painful *aphthous condition of the tongue and mouth* so often seen in childhood and infancy, and the glycerin of borax is decidedly superior to the preparation with honey as a basis. A little should be brushed over the child's mouth or smeared on by the nurse's finger several times a day. It is equally useful in *fissures of the tongue* in adults.

It is an invaluable remedy for *ulcerated nipples*, and possesses the advantage of keeping the infant's mouth healthy at the same time. A warm saturated solution applied to the scalp raises a lather like soap, and partially dissolves and effectually removes the dead epithelial scales. A solution of 1 dr. to 4 ozs. water makes a useful lotion in *itching* of the labium or anus, and a table-spoonful of the powder, or twice as much of the glycerin in one quart of water, proves valuable in *leucorrhœa* and *abrasions* or unhealthy states of the vagina or os uteri. It is recommended in *mercurial salivation* as a local application.

Bromum is very seldom employed in medicine except in combination. It has been recommended as a deodoriser and antiseptic, and a weak solution is useful when applied to *sloughing sores*. It is a powerful caustic, and has been used as such in *ulcerations of the neck of the uterus*, but possesses no advantage over other more agreeable and better known remedies. It is an irritant poison, and is no longer official.

Bromide of Potassium is a sedative to the nervous system; it is diffusible, and after being swallowed soon enters the blood, whence it is carried to the brain and spinal system of nerves, producing drowsiness and sleep by diminishing the quantity of blood in the cerebrum and lessening reflex excitability in the cord and cortical motor centres. It produces partial loss of sensation, and diminished reflex irritability in the back of the throat, which may be freely swept round with the finger (after a course of bromide) without exciting efforts to swallow or vomit. The diminished sensibility in the pharynx

has been considered to be owing to the local effect of the salt, as it is being eliminated by the mucous membrane of the part. The same effect is produced by the application of a watery solution to the part, but better results are obtained by cocaine.

Bromism is the name given to a group of varying symptoms following the prolonged use of the bromides, anæmia, mental dulness, unsteady gait, muscular weakness and prostration, dyspnœa on exertion, loss of sexual power, sleepiness, fetor, and sometimes a smell of bromine from the breath, general diminished tactile sensibility, and eruptions of acne spots about the face and shoulders. Bromide of Potassium is eliminated through the skin, breath, urine, and fæces, appearing as bromide of soda. The bromides of potassium, sodium, and ammonium are almost identical in action, and may be combined, only the latter is of more use in *whooping-cough* and *respiratory spasmodic affections*. The soda salt, though not so active as the potash one, should always be selected for chronic cases, as the base soda is less depressing to the heart and circulation.

Therapeutical action.—Bromide of potassium has been used in various *nervous* affections associated with convulsive movements, as in *epilepsy;* it is of greatest value in the worst forms, for the minor epilepsy or *petit mal* is often unaffected by it. In these cases the dose should be large—20 to 40 grs. three times a day—and animal food should be diminished or stopped during the use of the bromide, which should be continued for a long time after all trace of the disease has disappeared. In similar doses it is the safest treatment for *sea-sickness*. *Laryngismus*, *whooping-cough*, *asthma*, *delirium tremens* in its first stage, *acute mania*, *migraine*, *vaso-motor changes* (so common at the cessation of menstruation), *menorrhagia*, *nocturnal seminal emissions*, and *priapism*, are all decidedly benefited by the bromides. Its utility in these conditions is to a large extent explained by its power of diminishing reflex action. It appears to have more curative power with the vigorous than in the anæmic; this is particularly true in *neuralgia*.

In *sleeplessness*, arising from prolonged mental labour or worry, the bromide is invaluable. A full dose of 40 grs. at bed-time, repeated in 1 or 2 hours if necessary, produces refreshing sleep so different from that of any other narcotic as to lead one to believe it acts on the brain like natural sleep, which is characterised by anæmia; hence one explanation of its action in *mania* and affections accompanied by symptoms of *congestion of the head*. It sometimes relieves *cerebral vomiting*, and the *vomiting of pregnancy* when other remedies fail, and it stops the *convulsions* of several diseases, as *acute hydrocephalus*, &c., without in any way curing the maladies. Occasionally it has produced good results in some forms of *diabetes*.

It has been used in *tetanus* and *strychnine poisoning* in doses of 1 to 4 drs. The bromide of potassium acts as an alterative like the iodide, only much more feebly; and it has been used to reduce *enlargements of glands* and *syphilitic growths* and *hypertrophy of the spleen* when the iodide cannot be tolerated. Acne follows its use very often, and when it attacks the face is a barrier to its exhibition. This is largely prevented by adding a little arsenic, as in the following formula. The writer has often seen severe erythema nodosum follow its administration, and a host of cutaneous ailments have been attributed to it.

It should not be given in anæmic conditions, and it is worth remembering that it greatly increases the hypnotic effects of chloral, belladonna, opium, and hyoscyamus. The effect of bromide of potassium will be increased by combining it with the bromides of ammonium and sodium.

(For Epilepsy in an Adult).

℞. *Potassii Bromidi* ℥vj.
Sodii Bromidi ℥vj.
Liquoris Arsenicalis ℥ij.
Syrupi Aurantii ℥ij.
Aquæ Chloroformi ad ℥xx. *Misce.*

Fiat mistura. Capiat semi-unciam ter in die post cibos.

Buchu when administered soon finds its way into the blood; the volatile oil, of which it contains 1½ per cent., circulates in that fluid, and on reaching the kidneys is thrown out, acting in its elimination as a stimulating diuretic. As it comes in contact with the genito-urinary mucous membrane in *chronic cystitis* it acts upon it, either by its own stimulating powers or by altering the previously unhealthy urine, which then becomes a tonic to the relaxed membrane. It is best administered with pareira and uva ursi. It has feeble action on the bronchial membrane in *bronchitis*.

Butyl-Chloral Hydras possesses properties similar to Chloral Hydrate from which, however, it differs, in being a weaker hypnotic, in producing somewhat less cardiac depression, and in having a specific anæsthetic action upon the branches of the fifth nerve.

Liebreich believed that its action on the heart in even fairly large doses was not dangerous, and that the life of a poisoned animal could be saved by artificial respiration after the respiratory muscles had ceased acting, but its administration cannot be

conducted with much less caution than that of chloral hydrate, and as an hypnotic it is of little value.

As regards its power of relieving pain, short of producing sleep, its action is very weak, except in the case of *neuralgia of the fifth nerve*. Ringer finds it very valuable in nearly all neuralgic conditions of the face, occiput, neck, and in *migraine*.

In *neuralgia* the writer begins with 10 grs. for the first dose and 5 grs. every *two* hours for three or four more doses, and then 5 grs. 3 or 4 times daily.

It has but slight power when applied locally to the carious cavity of a painful tooth, and appears to be of very little use in ordinary toothache. It is best given in form of pill, which can be made to contain 5 grs. of the salt if a *little* mucilage be added. It can also be given in solution in water, with glycerin. The pills should be made fresh.

Cadinum Oleum—Oil of Cade is a local stimulant in scaly skin diseases, acting like tar. It is chiefly used in the chronic stages of inveterate *eczemas* and in *psoriasis*. It may be prescribed as an ointment mixed in all proportions with any firm cerate, or as a liquid combined with an equal amount of soft soap dissolved in alcohol (1 dr. to 1 oz.).

Caffeine in moderately small doses (2 to 3 grains) produces a state of mental activity, wakefulness, and restlessness, by acting as a stimulant to the brain and increasing *all* its functions. If the dose be repeated or increased, flashes of light before the eyes, noises and singing in the ears are experienced, and micturition becomes more frequent, and a state of muscular tremulousness supervenes, and the temperature *rises;* in still larger doses delirium and sleep supervene, followed by tetanic convulsions, but *very large* doses would be required to produce death.

The cardiac and respiratory centres in the medulla are stimulated by medicinal doses, as seen by the increased pulse rate and the rise of blood pressure. It acts on the cardiac muscle like digitalis, and its contractions are rendered stronger and slower, and, if previously faltering and irregular, become steady and firm by medicinal doses, while *large doses* may cause the healthy heart to act irregularly, just as digitalis does. It is a diuretic, often acting with *promptness*, and may be given in large doses in cardiac dropsy where digitalis fails; it probably stimulates the renal cells as well as raises the blood pressure in the kidney. In heart disease it is inferior to digitalis.

The writer has employed it in *chronic Bright's disease* with advantage, diminishing the albumen and anasarca, and increasing the quantity of urine; but the most careful and painstaking experiments, conducted on three such cases, over a prolonged period, failed to show any constant effect upon the daily elimina-

tion of urea. The diet was carefully regulated, the patients kept in bed, and the urine scrupulously collected, and the amount of urea daily calculated for some months. There was apparently a marked gain in weight in each case, and in one the albumen entirely disappeared.

Caffeine in 2 to 5 gr. doses is often efficacious in *migraine* and *unilateral* headaches, in which case the effervescing caffeine citrate is a valuable and grateful preparation.

The following is the best treatment for migraine :—

℞.

Caffeinæ Cit. gr. v.
Phenazoni gr. viij. *Misce.*

St. i. *ex. aq. cephalalgia urgente.*

Cajuputi Oleum is a powerful diffusible stimulant, and gives better and more definite results than any of the other essential oils. In addition to its antispasmodic powers it has a slight narcotic and anodyne action, a large dose (10 minims) diluted in an emulsion with mucilage and sugar producing effects not unlike those following the exhibition of musk. It will be found useful in the *prostration of low fevers*, *neuralgia*, and *hysteria*.

20 minim doses of the spirit of cajuput may be given every hour in a little sherry. A full dose gives great and speedy relief in *colic*, probably stimulating the bowel by direct contact. Externally it is a rubefacient, and may be applied to *painful and diseased joints* where there is much muscular spasm, and it has been used with success in *eczema*, *psoriasis*, and *acne rosacea*.

Calcium—In most of its forms, in minute doses, lime is a restorative, supplying to the blood an element found in the normal tissues. Its free use, however, like the alkalies, will be found to increase waste by quickening the retrograde metamorphosis of many constituents of the blood and tissues.

Chloride of Calcium is recommended in *scrofula* and *tubercle* in 10 gr. doses. It acts as a restorative, and has been recommended in *rickets* and ailments of defective nutrition, and under its use large glandular tumours have been known to disappear. It markedly increases for a time the coagulability of the blood, and Dr. Wright has administered it in doses of 15 to 30 grs., with the view of causing coagulation of the blood in aneurysmal sacs. In one case treated at Netley for abdominal aneurism by this method, and afterwards, at Dr. Wright's suggestion, treated upon the same plan by the writer, great improvement occurred ; and when the patient was discharged from hospital, pulsation had almost entirely disappeared, and the tumour had very markedly diminished in size.

Urticaria and *erythema* are often speedily relieved, and even the itching of jaundice is removed. In these cases it acts by checking exudation.

Carbonate of Calcium and *Chalk or Creta Præparata* are valuable antacids, possessing unirritating astringent powers. They are given when we wish to reach the *intestinal surface* with an alkaline preparation of calcium. Unless the dose is very small the chalk will find its way through the duodenum, the greater part still remaining as carbonate, and passing along the intestines it will neutralise any free acid which it meets with, forming a chloride or lactate; it thus diminishes the free secretion of the bowel, so that costive, hard, or dry motions are the result. We can easily see from this its value in the *diarrhœa* accompanied by acid, acrid evacuations, especially seen in children, generally in hot weather. It is very useful in various *stomach* derangements with acidity, but the liquor calcis is better where we want to reach the first part of the digestive tract, and it is a good rule to order these different remedies in this systematic way—*chalk* for the *intestines* and *lime water* for the *stomach*. The lime preparations being absorbed in a very slight degree, only minute doses of them need be ordered; but where local antacid action is required these salts may be freely administered, though not for a very long period, as they, like magnesia, are liable to form concretions in the bowel. Externally, chalk or the precipitated carbonate is useful, on account of its mild astringent or desiccant properties, when applied to *weeping skin diseases*, especially *intertrigo* about the groins or buttocks of infants, and both are valuable antidotes in *poisoning by the mineral acids*. Sir D. Duckworth uses with good results an ointment of equal parts chalk and benzoated lard in *erysipelas*.

Calx, *Calcis Hydras*, and *Liquor Calcis*—Lime, from its great avidity for water, acts when applied to moist tissues as a powerful caustic, though its eschar is very superficial. It is not often used alone, but mixed with potash and moistened before application with a little alcohol, it forms the well-known Vienna Paste used in *uterine ulcerations and cancerous growths*. Slaked lime (lime to which half its weight of water is added) is not used in medicine except to make lime water. When this reaches the stomach it is decomposed into the chloride or lactate, and, as such, some of it finds its way into the blood. It neutralises and checks the excessive activity of the gastric juice, when administered while digestion is going on.

It thus is a valuable antacid, and the residue, if the dose be large, acts as a mild astringent upon the *intestinal mucous membrane;* and, eventually, if the administration be continued the urine becomes alkaline, and it may thus be useful in *uric acid gravel* and to dissolve calculi. It is best given in milk, as its

taste cannot be detected in that liquid. 2 or 3 ozs., mixed with three times as much milk, often soothe the stomach in painful *dyspepsia*, *cancer*, and *gastrodynia*, and stop the vomiting in these ailments. The addition of 1 oz. to 1 pint of cow's milk prevents the formation of curdy masses, and stops *infantile vomiting* depending on this cause. Lime water makes a good injection in *leucorrhœa*, *otorrhœa*, and *gonorrhœa*.

Applied externally, lime water is a mild astringent to moist *eczema*, &c.; mixed with equal parts of olive oil it forms a rich creamy emulsion, or with linseed oil it makes the popular Carron oil, so soothing to *burns* and *scalds*, and which may be improved greatly by the addition of 1 or 2 per cent. of carbolic acid; and is useful when applied to *cracked nipples*.

The saccharated solution of lime possesses the same properties as lime water, only it is about 14 times stronger.

Calcii Phosphas is of importance as a food and constituent of the body, and is present in excess wherever cell formation is active. Beneké has found it very useful in the diseases in which it appears in excess in the urine, but it does not act simply as a *restorative*, for in *rickets*, *mollities ossium*, and other lesions of *malnutrition*, the phosphates of lime may load the urinary secretion, and it is hard to see how the few grains daily absorbed could replace the great quantity poured out of the system in these cases.

It is thus clear that if phosphate of lime is of use in these cases (as it sometimes undoubtedly is), it must be by *striking at the root of the error of assimilation* possibly existing in the nerve centres. Its administration has been found to hasten the *repair of fractures*, and the withdrawal of lime salts from the food of animals renders the bones soft and spongy. The premature decay of the teeth in Americans is probably owing to the absence of lime salts, caused by the perfection of their machinery, which too effectually removes the external portion of the grain in the manufacture of flour.

In the stomach lime undergoes changes, and enters the blood as a different salt. *Anæmia* pure and simple is sometimes benefited by a course of phosphate of lime, as are also *scrofulous adenitis*, *phthisis*, and *chronic diarrhœa*.

Kolischer treats *tuberculous joints* by the injection of a solution of acid calcium phosphate.

Parrish's Syrup is an elegant and useful form in which to administer the Phosphates of Calcium and Iron.

Calcii Hypophosphis, in common with other Hypophosphites, has been strongly recommended in *phthisis*. In their action they resemble phosphate of lime, and like it they possess none of the properties of free phosphorus. Some have fancied that under the use of these remedies the tubercular or scrofulous

deposits are more prone to the calcareous degeneration. In *chronic bronchitis*, with much expectoration in young subjects, accompanied with loss of flesh and sweating, the hypophosphites will often give better results than any other remedy. Probably in these cases they act as nervine tonics to the respiratory and other centres.

Fellow's Syrup affords an agreeable method of administering these remedies, and seems to supply every want, combining with the lime the tonic properties of quinine, iron, and strychnine, but the writer has found that it very often is not tolerated by the stomach.

The new B.P. Syr. Calcii Lactophosphatis is an excellent method of administering lime salts.

Calx Chlorinata (Chlorinated lime) is valuable, not on account of the lime, but because it gives off hypochlorous acid, a powerful oxidising agent, which destroys any organic matter with which it comes in contact. This acid, being itself unstable, gives off chlorine, which splits up any remaining matter by seizing on its hydrogen, and setting oxygen free. This double action makes this substance invaluable as a deodoriser. Plates covered with chlorinated lime, and moistened with water, placed in different corners of the sick room, give off, through the agency of the carbonic acid of the room, as much chlorine as keeps down effluvia. If more rapid deodorisation is required, the room is treated in a different way: the patient having been removed, the salt is placed in a deep basin, and diluted sulphuric acid poured on it, and the room closed up for 24 hours; in this way all the chlorine is liberated, and seizes upon the hydrogen, splitting up the ammonia, sulphuretted hydrogen, &c., with which it comes in contact.

By destroying the germs which cause putrefaction it acts as an antiseptic, and it destroys odours much better than carbolic acid, which has little power in this way, though this latter is a better antiseptic.

It is used with advantage when applied in solution to parasitic skin diseases and *foul sloughing wounds*, *ozæna*, &c. ½ dr. of the solution added to 1 oz. water makes a good gargle in *malignant scarlatina* or *diphtheria* with fetid ulceration.

Internally, this salt has been recommended in *putrid fevers*, and may be given in the form of the solution, in 20 minim doses in peppermint water.

Calx Sulphurata is administered for the sake of an action which it is believed to possess over *suppuration*. It is regarded as an Antisuppurative, aborting the process if in its early stage; and benefit has followed its use in *boils*, *abscesses*, and *acne*. In large doses it is an irritant poison, and even small doses often nauseate seriously. It is best given (⅓ gr.) in pills.

Calumbæ Radix is one of the most popular pure bitter tonics, and, possessing no tannin, is devoid of astringency, and may be freely given with iron. Chiretta, Quassia, and Gentian closely resemble Calumba in their effects upon the stomach. By the impression which they make upon the peripheral filaments of the nerves of the tongue and mouth, they increase the saliva and the gastric juice probably even before being swallowed. The gastric juice is further increased when they reach the stomach, and probably the vascularity of the organ is somewhat augmented, since these remedies in large doses cause irritation, and, when long continued, a low form of gastritis, apparently by over-stimulation. The gastric secretion being thus more freely poured out, the supply regulates the demand, and the appetite is improved. Changes of a similar nature probably occur further down the intestinal tube, and the digestion beyond the duodenum is possibly improved.

These bitters are used in *dyspepsia* and in the *debility attending convalescence from acute diseases*, where they are sometimes invaluable in stimulating the appetite and digestion. They are contra-indicated in all inflammatory states of the gastro-enteric tract. To get the full benefit of a vegetable bitter it is advisable to order its various preparations in combination.

℞. *Tinct. Calumbæ* ℥j.
Infus. Calumbæ ℥xj. *Misce.*

Fiat mist. cujus capiat cochlearia duo ampla ter in die ante cibos.

Cambogia—Gamboge is a hydragogue cathartic; when swallowed in large doses it acts as an irritant to the mucous membrane of the digestive tract, exciting the various glands to pour out increased secretion, and thus augmenting considerably the watery element in the motions, which, after a full dose, become liquid. The vermicular contractions are greatly intensified, and the contents are swept rapidly down the canal.

Its action is severe, and the griping pains caused by it are very annoying, so that it is seldom now used alone, though it is an excellent addition to many purgative pills. In small doses it is diuretic, and the colouring matter has been said to stain the urine. The compound pill may be given in 5 grain doses every 8 hours in *dropsies* and *obstinate constipation*. The action of gamboge is more marked on the small intestine than on the colon. In large doses severe inflammation of the alimentary tract results, and death supervenes, unless, as is nearly always the case, active vomiting expels the drug early. In poisonous doses, Orfila found that it often only produced vomiting; owing to the

violence of its action on the intestines their movements became paralysed. It has no action on the liver, though the presence of bile and fat seem necessary for its absorption. Schaur found that the hypodermic injection of gamboge did not cause purging in dogs.

Camphora is very uncertain in its action, and the effects produced by small doses are so variable that it is not often employed internally save as a flavouring ingredient. In large doses (20 grs.) it is a diffusible stimulant, directly causing a flow of blood to the gastro-intestinal membrane, and may produce vomiting; by stimulating the nerve centres it produces a comforting and exhilarating effect, occasionally going the length of gay delirium and convulsions, with increase of the strength of the pulse and the cardiac contractions, and when continued for some time it produces *loss of power of the sexual organs* (though small doses have the opposite effect), and it consequently is valuable in *excitement of the genitals*, *chordee*, *emissions*, &c. In the *diarrhœa* of hot weather small doses often give excellent results, probably by its marked antiseptic action. The vapour is reputed to possess marked effects upon *catarrhal affections of the respiratory membrane*, and 5 grs. added to each dose of expectorant mixture are useful in the *chronic bronchitis* of the aged, and 5 to 10 gr. doses, repeated every six hours, benefit *hysteria*, *dysmenorrhœa*, *and other spasmodic affections*. It is still, with some practitioners of the old school, a favourite stimulant to the heart in low fevers, and it is believed to control delirium. It has marked antigalactagogue action, and should be applied to the breasts at the same time that it is given in 3 gr. doses.

Externally, it is a stimulating application, used in *chilblains*, and its mild rubefacient properties render it a popular ingredient in most liniments for *rheumatic troubles*. The Compound Camphor Liniment is a powerful counter-irritant, and may be made to cause vesication. ½ dr. camphor to 1 oz. of zinc ointment allays the itching of *eczema* about the genitals.

Milk dissolves camphor readily, 1 oz. taking up nearly 1 dr. of it, and it is the best method of administering the remedy, especially in *low fevers*, where a tea-spoonful of the milky solution may be given every three hours.

Rubini's solution consists of a solution of 1 oz. camphor in 1 oz. (by weight) absolute alcohol. Dose—3 to 8 minims.

Cannabis Indica is a true narcotic, like alcohol or opium, producing first a period of excitement, or intoxication, followed afterwards by sleep and coma. Its exciting stage, however, is better marked than that of these remedies, and is much *longer* than that of opium. It is freely indulged in, in India under the name of Hashish. The intoxication, often lasting a couple of

hours, is characterised by delirium of a pleasant or boisterous kind, with surprising mental confusion and distorted mental ideas of the patient's individuality and position, alternating with fits of prostration bordering on catalepsy, and followed eventually by sleep, in which pleasant or mirthful dreams generally run riot. The stomach is not affected, and the appetite may be increased. It is a powerful aphrodisiac. Binz describes the dominant sensation experienced when smoking Indian hemp as a pleasing indifference to all external impressions, a sort of bien-etre, the imaginative Oriental enjoying the bliss of paradise, and the sober Teuton passing into the land of dreams and visions.

The sensibility is diminished, cutaneous anæsthesia and blunting of the muscular sense being observed. The pupil is dilated, constipation does not follow, and sweating is never great; hence its use has been followed by gratifying results as an anodyne in *neuralgia* and in *migraine*, a hypnotic in *sleeplessness*, *delirium tremens*, and especially in *mania;* an *antispasmodic* in destroying spasm and pain, as in *asthma*, *hepatic* and *renal colic*, &c. Stephen Mackenzie has found that full doses, morning and night, relieve dull *continuous headache* when other remedies fail. The writer has obtained best results in chronic or continuous migrainous headaches with the following:—

℞.

Ext. Cannab. Ind. *gr.* ½
Butyl-Chloral Hyd. *gr.* iv. *Misce.*

Ft. pil. *Mitte tales* xxiv. *St.* i. *ter in die.*

It is stated to act as a direct stimulant to the uterus in *menorrhagia*, and it allays ovarian irritation. It has been successfully used in the treatment of *tetanus*. It has been noticed that *hæmaturia* has disappeared after the administration of this drug, and sometimes it acts as a diuretic.

10 to 20 minims of the tincture should be given in sherry, or in a tea-spoonful of brandy, on account of its decomposition when added to water; but 1 oz. of mucilage emulsifies 1 dr. of tincture. The *fresh* extract made into a pill will be found the most reliable form, in doses of ½ to 1 gr.

In the section on Non-Official Remedies the reader will see noticed a preparation under Cannabin Tannas and Cannabinol.

Cantharides is not often administered internally, though it produces definite results, acting as a powerful irritant to the stomach and genito-urinary organs, causing in over-doses frequent, painful, bloody micturition, with priapism, bloody, painful stools, salivation, and symptoms of violent irritant poisoning, followed by convulsions, delirium, and asphyxia.

In small doses it is diuretic, aphrodisiac, and emmenagogue. The cantharides is absorbed, and circulating in the blood, reaches the urinary organs, which it irritates as it is being eliminated. The effect of cantharides upon the kidneys begins as a genuine inflammation within the glomeruli, which gradually spreads among the cells of the tubules until all the tubes become affected, producing albuminuria and hæmaturia. The mouth, stomach, and intestines are affected by direct contact with it after being swallowed, and its action on the genital organs and uterus is generally explained by the sympathy that exists between these parts and the urinary tract.

It has been advocated in various *kidney diseases*, after the acute stage, as a diuretic, and it is valuable in *bladder* cases, which are characterised by want of power in the sphincter especially in women. It has been recommended in *incontinence of urine*, *impotence*, *gueet*, and *leucorrhœa*. Liebreich advocates Cantharidinate of potash as a remedy for *tuberculosis* in hypodermic doses of $\frac{1}{1300}$—$\frac{1}{824}$ grain. He claims for it that it causes the exudation of serum from the capillaries, and the serum nourishes weak cells, and by bringing the cantharidin to the bacilli these are destroyed by its antiseptic property. *Lupus* and *laryngeal tubercle* have been reported as cured by this method. It cannot, however, be said to have fulfilled the expectations of its advocate.

1 to 3 minims of the tincture will be found enough for an ordinary dose, freely diluted with barley water.

Externally, cantharides is used diluted in various ways as a rubefacient, as in *stimulating applications to the scalp*, where the object is to keep up a constant excessive supply of blood for the nourishment of the hair bulbs, but it is for producing vesication that the Spanish fly maintains its importance in medicine. It acts by causing a rapid local inflammation of the skin, beginning with tingling pain, heat, redness, and eventually swelling; serum appears in from 4 to 12 hours.

The peripheral extremities of the nerves supplying the skin of the affected part conduct the stimulus of the blister to the nerve centres, from which it may be radiated, transferred, or reflected to centrifugal or trophic nerves, which may effect various changes in the areas to which they are supplied.

In this, the most probable explanation, it is easy to see (1) the effect which blisters may produce upon distant parts; (2) they also affect parts in the immediate neighbourhood by extracting the blood from them, though this must be to a small extent; (3) they may affect neighbouring parts by direct spread of the irritation originally produced, as the peritoneum and pleura have been seen inflamed from the application of a blister to the abdomen or chest; and the writer believes that he has seen pericarditis produced in this way in thin subjects. Brunton

points out that the skin and tissues immediately underneath the blister are congested, whilst the deeper layers of tissue have their vessels contracted. Through thick parietes a blister would not likely cause congestion of the pleura.

When *absorption* is the result desired, Brunton advises that the blister should be applied directly over the part, but if reduction of congestion or inflammation is aimed at it should be applied at a little distance, as in pericarditis it might, if applied directly over the inflamed sac, increase the mischief.

Robin has recently shown that blisters promote phagocytosis, and cause so much extra air to pass through the lungs that the absorbed oxygen may be doubled.

In *neuralgia*, blisters applied over the seat of pain intensify the suffering, they should be applied close to the spine—over the posterior branch of the spinal nerve-trunk—from which the painful nerves issue; *sciatica* is often benefited by a small blister placed over the course of the nerve.

Various *eye inflammations* are modified or checked by counter-irritation behind the ear, and though the usefulness of blisters is doubted in *acute pleuritis* and *pneumonia*, there can be little question of their value in causing the absorption of long-standing pleural effusions, in which cases great good is derived from *flying blisters*—that is, a series of very small blisters (each not larger than a crown) kept on for a short time—say two hours. Indeed, it may be laid down as a rule that any benefit to be had from a blister is obtained during the first five hours of its application, all of which time it keeps up a stimulating effect upon the general system; after this, much depression often results, which cannot be accounted for, as some suppose, by the mere loss of serum; if vesication does not occur in this time a poultice generally determines it. In applying flying blisters in *pleuritis* or *sciatica* a small blister may be applied for one or two hours, then removed and applied a few inches further away where it may be left for two or three hours, after which time the same blister may be applied for three or four hours to another spot a few inches further from the site of the second one.

In *acute rheumatism*, blisters to the affected joints have been long advocated; but Dr. Harkin has pointed out surprising results obtained by a large blister over the heart, early in the disease, and the writer has seen it reduce temperature and pain in a most decided way. Graves recommended blisters in various *feverish states* with much *prostration*; counter-irritation over the nape of the neck controls many forms of *headache*.

Dr. Harkin obtained good results in *diarrhœa* and *cholera* by blistering the skin over the course of the vagus in the neck. Petit and M. Verneuil have corroborated his views about the

successful treatment of hæmorrhages like epistaxis and rebellious bleeding from piles, &c., by revulsion over the liver region.

For all purposes the emplastrum cantharidis is the most manageable preparation—the liquid or collodion acts much more quickly. Unless the bleb is large it may be let alone, the blistered surface being covered with greased lint or cotton wool. Sometimes cantharides affects the urinary organs after a blister, by being absorbed through the skin ; free diluent drinks, with a few grains of camphor internally, and a morphine suppository, generally remedy this.

Blisters should not be applied or kept long on the old or infirm, or on paralysed parts, or over bony prominences, or on the very young, or in acute kidney diseases.

Caoutchouc is now introduced into the B.P. for its physical properties in making a protective covering like the old gutta-percha solution or Traumaticine, which acted like collodion in some *skin diseases*.

Capsicum when taken into the mouth increases the secretion of the salivary glands ; when swallowed it acts as a stimulant to the mucous membrane of the stomach, and increases its secretion, its internal local action being probably like its external rubefacient effect, so that it might be called an internal rubefacient. In repeated doses it produces a slight narcotic effect, and it increases the functional activity of the genital organs. In large doses it causes gastro-intestinal irritation or inflammation. It may act as a diuretic.

Prof. Chéron believes that it acts upon the vascular system, and, like ergot, affects powerfully the unstriped muscular fibre in the walls of the vessels either directly or through the vaso-motor nerves. Some benefit has followed its use in *uterine hæmorrhage* in doses of 2 to 10 grs.

The stomachic effects of cayenne are seen in its free use as a condiment and appetiser in warm climates, and it is useful in *dyspepsia*, and invaluable as a tonic in *dipsomania*, in which 10 to 20 minims of the tincture may be given every two hours before meals. In *delirium tremens* large doses (30 grs.) sometimes produce sleep. Locally, it is useful in the form of a gargle for *relaxed throats*. 1 dr. tincture with 1 dr. tannin, and 10 ozs. acid infusion of roses, make a splendid gargle. Concentrated preparations will redden the skin almost to vesication, but with much pain and burning, and are said to remove the discoloration of *bruises ;* a paste composed of capsicum, and known as "Chili paste," is used as a popular rubefacient, its official representative is the new Ungt. Capsici. Buck obtains rapid relief from *lumbago*, *acute torticollis*, and

muscuar rheumatism by applying an infusion on lint covered in under oiled silk.

℞. *Tr. Capsici* ℥iij.
Spt. Ammon. Aromat. ℥i.
Tr. Cinchonæ ℥j.
Tr. Card. Co. ℥vj.
Aquam ad ℥viij. *Misce.*

Fiat mistura. Signa—"A table-spoonful with the same quantity of water every two hours, or when the craving for drink comes on."

Carbo Ligni may be employed internally as an antidote in poisoning by phosphorus and by the alkaloids morphine, strychnine, &c., with which, if given immediately afterwards, it combines, and renders their action harmless—½ oz. neutralising 1 gr.—but its administration should not interfere with the use of the stomach-pump, emetics, and purgatives, which should follow.

Internally, wood charcoal is administered in *flatulent conditions of the stomach and intestines* as an absorbent and deodoriser ; it occasionally checks vomiting and the formation of gas, and stops fermentation and purges mildly. Jenner used charcoal in dr. doses as an enteric disinfectant in *typhoid*, but it is possible that it might cause irritation of the ulcers in the bowel. It is maintained by many that charcoal when swallowed becomes so moistened by the contents of the stomach that no gas can be absorbed by it. The writer always orders the freshly-dried charcoal to be swallowed wrapped up in wafer paper.

Externally, charcoal acts as a powerful deodoriser and antiseptic, and, as such, may be freely applied to *putrid sores* and *gangrenous limbs*, or it may be spread on plates to sweeten the air of the sick room. These properties depend upon its power of absorbing and condensing in its pores gases like oxygen, which destroy the gaseous products of putrefaction by coming into direct contact with them. A charcoal poultice is an excellent application to *foul ulcers*. Animal charcoal (now excluded from the B.P.) may be given like the wood preparation, in tea-spoonful doses in water. It should be freshly-prepared or reheated before use, and administered *dry* in wafer paper.

The action of charcoal has been exhaustively studied by Wilde, and his results are published in the "Parkin Prize Essay." He concludes that, though *devoid of antiseptic properties*, it may act by oxidising the chemical substances formed during abnormal decomposition, or the toxins produced by pathogenic organisms.

Carbon. Bisulphidum, though an active poison, is only introduced now into the B.P. as a solvent for India-rubber and phosphorus. It has been advocated internally (2 ozs. of a saturated solution in Aqua M. Pip.) as a substitute for the sulphuretted hydrogen treatment of *tubercle*, also in *tubercular ulceration* and *typhoid fever*.

In solution of the strength of 4 minims in 1 pint of water it is a powerful antiseptic, destroying all bacterial life. It has been found useful as a dressing to *foul sores*, and as a spray in *diphtheria*, and as an inhalation in *cholera* and *typhoid fever* when given internally at the same time. When the vapour is inhaled it produces *anæsthesia*, like chloroform, only the insensibility is shorter. Externally, the liquid is a painful irritant, and has been used as a counter-irritant in *scrofulous adenitis*. The spray produces local anæsthesia like ether. Its disgusting odour is a serious drawback to its use, and, moreover, it is a powerful poison. Reports from Chili state that 2 oz. doses of a saturated solution of the drug in water, when given with milk before meals, relieved *dysentery*, *ayspepsia*, *typhoid fever*, &c.

Cardamomum acts as a warm stomachic and carminative, like ginger, increasing by stimulating the gastric surface the secretion of the part, and improving the appetite. Its local stimulating influence increases by reflex action the peristaltic movements of the intestines, and thus flatus is expelled. It makes a good corrective addition to purgative medicines, and, as the tincture is of a bright red colour, compatible with most drugs (iron excepted), it is a prized flavouring and colouring ingredient, and medicine containing it has a better chance of remaining in an irritable stomach than if given alone.

Carui Fructus—Its action is explained under Anethum, with which it is practically identical.

Caryophyllum—Cloves, when administered, act as a stomachic. This remedy resembles the previous two in its tonic, carminative, and stimulating effects. The essential oil is powerfully antiseptic ; when applied to the terminal filaments of a painful and irritated nerve it acts as an efficient anodyne ; hence its use in *toothache* and in some cases of *superficial neuralgia*. Five drops on a little sugar speedily remove pain caused by accumulations of air in the bowel, by exciting reflex muscular contractions, driving the air forwards or backwards, relieving over-distention, and acting as a local anodyne to the irritated nerves of the part. The experiments of Brunton and Carl show that carminatives, like cloves, do not cause absorption of the gases in the bowel. They found that oil of cloves markedly increased the secretion of the bowel.

Cascara Sagrada is, in large doses, an irritant to the gastro-intestinal membrane; in moderate doses (½ dr. liquid extract) it acts as a stimulant to the entire glandular apparatus of the alimentary canal, increasing slightly the *secretion* and markedly the *peristaltic action* of the intestine by stimulating the muscular fibres, and producing healthy copious evacuations. Smaller doses (5 to 10 minims) have a decidedly tonic effect upon the stomach, like the vegetable bitters, increasing the appetite and mildly stimulating the liver. Cascara is the best remedy yet introduced for *chronic constipation*, and the dose can be so graduated that painless, soft natural motions are voided daily where constipation has been the rule for years. The dose can be gradually *diminished* while the good effects remain, and generally even in aggravated cases no augmentation of the dose is necessary. The liquid extract may be given in doses of ½ to 1 dr. every evening. The main element in the successful treatment of constipation by cascara is to insist upon the patient so graduating the dose himself as to produce one morning motion *without purgation*, and this must be kept up for at least two months. The solid extract may be likewise employed in pills alone or with aloes. After a time the drug can be entirely withdrawn.

℞. *Extracti Cascaræ S. Liquidi* ℥ii.
Tr. Nucis Vomicæ ℥iii.
Glycerini ad ℥iv. *Misce.*

Fiat mistura, cujus capiat ℥i. *mane nocteque ad quatuor vicem deinde omni nocte.*

Cascarilla is an agreeable tonic, acting like Calumba, only it possesses decided aromatic qualities. It has feeble febrifuge properties, like cinchona, and the volatile principle which it contains may possibly act upon the respiratory mucous membrane. It is useful in *dyspepsia*, where a stimulating tonic is indicated, and when smoked in a pipe it is valuable as a *substitute for tobacco* when we wish to wean heavy smokers from their vice. W. G. Smith gives the following in convalescence from fevers :—

℞. *Acid. Nit.-Mur. Dil.* ℥ij.
Tinct. Cinch. Co. ℥j.
Infus. Cascarillæ ad ℥viij. *Misce.*

Capiat ℥ss. *vel* ℥i. *ter in die.*

Cassiæ Pulpa—This preparation is very seldom used in medicine except as an ingredient in senna confection. It is a mild laxative, like manna, and it probably acts by stimulating the peristaltic movements of the intestines.

Catechu is a valuable astringent, acting exactly like tannic acid (which see). It is given in *passive diarrhœas* and *hæmorrhages*, and is well suited for the treatment of such cases in children. It may be chewed before food in *pyrosis*.

(For Diarrhœa in a child 1 year old.)

℞. *Tinct. Catechu* ℥iij.
Spt. Chloroformi ℥i.
Mist. Cretæ ad ℥iv. *Misce.*

Fiat mist. cujus capiat coch. i. *min., post singulas dejectiones liquidas.*

Cera Alba, Cera Flava, and **Cetaceum** are seldom employed internally. When swallowed they act as protectives or demulcents, by covering over the gastro-intestinal surface from irritating secretions, and externally they are largely employed as emollients. Possessing bland, unirritating qualities, they are valuable in making the groundwork or basis of more active ointments or cerates. Spermaceti formerly was much employed as an expectorant, but it most probably is devoid of such virtue. It may be given beaten up with egg and warm milk.

Cerii Oxalas is a gastric sedative, acting probably like bismuth, in doses of 5 to 10 grs. It was introduced as a remedy for the *vomiting of pregnancy*, but it is gradually falling into disrepute, and should have been omitted from the new B.P. It has been tried in *epilepsy* and *chorea* with very doubtful results.

Chirata is a pure bitter tonic, exciting very gently the secretion of the gastric juice, like calumba, gentian, and quassia, aiding digestion and improving the appetite. Its effects are best seen in the *atonic state of the stomach of drunkards* after a prolonged course of drinking, and it may be combined with bismuth or a mineral acid, the former if *nausea or vomiting*, the latter if a *furred* state of the tongue exist.

Chloral Hydras induces sleep identical in every respect with sound, natural, refreshing slumber, lasting 5, 6, or 8 hours, devoid of dreams, and free from stupor and narcotism, and not followed by gastric or other trouble. It does *not* act, as Liebreich—its introducer—supposed, by being decomposed in

the blood into chloroform on meeting the alkali of the circulating fluid, since this is too weak to decompose it, and the odour of chloral and not of chloroform is perceived from the breath ; and chloroform is not found in the blood.

It does not markedly relieve pain, nor influence the nerves of sensation, in safe doses ; hence if severe pain be present, chloral unlike opium, will not relieve it, unless in doses just short of affecting reflex action, and if the pain continue, probably no sleep will supervene. Reflex action is weakened and destroyed by large doses, the blood pressure falls from the vascular dilatation caused by paralysis of the vaso-motor centre and the cardiac ganglia ; the pulse and respiration are slowed ; and if a still larger quantity is administered, loss of sensation and deep coma occur. Death results from paralysis of the heart by its effect upon the cardiac ganglia, or stoppage of the respiration ensues through its action upon the respiratory centre. The motor nerves or muscles are not directly affected, but the pupil is *contracted.* The *temperature falls markedly*, and Brunton found that this fall was so great as to alone cause death. The temperature falls from $\frac{1}{2}^{\circ}$ to $1\frac{1}{2}^{\circ}$ F. after ordinary hypnotic doses. The drug appears in the urine, and if this secretion be alkaline it may change the chloral into chloroform. Urochloralic acid also is found in the urine after the administration of chloral.

Chloral is used as an hypnotic in *sleeplessness, caused by over-work or worry*, and *delirium tremens* is the affection in which its virtues have been most prized, given in 20 to 30 gr. doses. After the delirium has lasted several days, the writer believes chloral to be a dangerous remedy, which must be used with great caution, if employed at all, the heart at this time being especially susceptible to its action. He believes that the use of chloral raises the mortality in this disease. In the administration of chloral as an hypnotic, it is more than probable that it is answerable for more deaths than all the other hypnotics together, and as an hypnotic in delirium tremens the writer has ceased to use it.

It is powerfully antispasmodic, and has been used with benefit in *infantile* and *puerperal convulsions*, *chorea, asthma, sea-sickness*, and *acute mania ;* and it is highly beneficial, and occasionally curative, in *tetanus.* Excellent results are obtained in *whooping-cough*—a child 2 years old may get 1 to 2 grs. every 3 hours. It relieves the early *pains of labour*, without directly hindering the uterine contractions.

Chloral should be given with great caution to patients with fatty hearts or atheromatous vessels ; and as its hypnotic effects come on in a very short time (less than 30 minutes), and pass of as rapidly, it should be repeated inside an hour or two if the

result is not produced, and the patient should always be in bed before swallowing the first dose. Externally, it is a good antiseptic, and a lotion of 8 grs. to 1 oz. is a painless stimulant to *unhealthy ulcers*, and often cures *eczema*.

Powdered chloral sprinkled over adhesive plaster, gently warmed and laid on the skin, makes a painless, speedy, and effective blister, superior to cantharides (Fauntleroy).

Chloral Camphor is a liquid consisting of equal quantities of chloral and camphor rubbed together; it dissolves morphia and other alkaloids, and is an elegant application in superficial *neuralgias*. Chloral menthol is prepared in the same way.

Chloral is used as an antidote to strychnine and Calabar bean. In addition to its treacherous action upon the heart, chloral is very liable to induce a chloral habit upon those who use it often, and as the victim goes on increasing the dose so as to induce sleep, without any warning he may take a dose which stops his heart. (See under Poisoning).

Chlorine, when inspired, acts as a powerful irritant, causing death from spasm of the glottis or inflammation of the air passages; greatly diluted with air it is a stimulating expectorant.

Externally applied it is a rubefacient, but it is only used in medicine for its powerful antiseptic and deodorising properties. (See Calx Chlorinata.) Internally, a solution of chlorine has been recommended in *fevers* as a germ destroyer, but in doses sufficient for this purpose it would destroy life. Yeo's Chlorine treatment of *typhoid fever* has not proved satisfactory in the writer's hands. The mixture is made by shaking up 30 grs. chlorate of potash with 1 dr. strong hydrochloric acid in a 12 oz. bottle, and adding water gradually with continual shaking of the corked bottle; 24—36 grs. of quinine are then added, and 1 oz. given every 1 to 4 hours.

Chloroform is used in medicine as an inhalation to produce general insensibility, and is swallowed or applied externally as a remedy for various complaints. The vapour, when inhaled, gives rise at first to symptoms often differing widely in different individuals, and depending upon some peculiarity of the patient.

The "Preliminary Stage" begins with some cough or suffocative feeling, stimulation of the cerebral convolutions and higher centres, exhilaration of spirits, sounds in the head, mental confusion with congestion of the eyes and face, and symptoms resembling mild alcoholic intoxication. The sensibility is blunted.

Often there now succeeds what has been known as the "Struggling Stage," with marked mental or motor excitement and intoxication, acceleration of the pulse (from excitement),

lividity of the face, greatly diminished sensibility, and dilatation of the pupils;

Rapidly passing into

The "Anæsthetic Stage," or state of complete narcosis, characterised by *depression* of the nerve centres which were previously *stimulated*, when there is total insensibility and muscular relaxation, with suspension of the cerebral functions, and more or less paralysis of the lower or organic life centres, loss of reflex action, diminution of the force of the pulse, and contracted pupils.

The operator recognises this stage by holding up a limb and it falls perfectly flaccid; by touching the conjunctiva, when no attempt at winking occurs; by exposing the iris suddenly to light after having the lids closed, and sluggish contraction follows; by pinching strongly the skin of a sensitive place, and not the slightest wincing is noticed.

If the inhalation is pushed further, death may occur. (1) The *respiration* is interfered with, so that death occurs through apnœa from the stoppage of the breathing, through the action of the chloroform on the respiratory centre, or on account of the tongue falling back, or vomited matter getting into the trachea. (2) By the *heart* becoming *directly* paralysed, through the influence of the chloroform on the cardiac ganglia; and this may happen at any stage, and without warning. (3) Both respiration and heart may suddenly fail at any stage. Much controversy has taken place over the manner in which the drug kills—*i.e.*, whether the death is caused by cardiac or respiratory failure. Hare recently affirms that death takes place by *vaso-motor paralysis*, causing fall of blood pressure. The patient's blood stagnates in his capillaries, and his heart stops because it has no blood to propel. In this way he reconciles the rival views, and urges the importance of inverting the body or bandaging a limb tightly. The failure of the respiratory centre he maintains is anæmic, and when it occurs before heart stoppage it is simply because the head is at a higher level than the heart. Newman and Ramsay point out the importance of using freshly-distilled chloroform.

☞ Respiration must be carefully watched and its irregularity or failure met by the instant removal of the inhaler; and if there be asphyxia, the chin should be forcibly drawn away from the sternum, or the tongue drawn forward, or artificial respiration, which is the best remedy to rely upon, may be performed; the cold douche may be used at the same time. When the heart stops, the patient's head should be placed lower than his body, artificial respiration should be kept up, and nitrite of amyl, ammonia inhalation, and galvanism may be tried. Hypodermic injection of ammonia appears to be the most promising treatment

The pupil gives important indications; as long as it remains contracted there is, as a rule, little danger. The first sign of vomiting often is a slight dilatation. If the drug is now pushed this may pass off, but full dilatation of the pupil always means grave danger.

Brunton believes that death may be often the result of *shock*, and may be caused by too little instead of too much chloroform. He explains how death has so often followed the performance of trivial operations where deep narcosis is generally considered unnecessary. When no chloroform is administered, the stimulus to the sensory nerves produced by an operation causes reflex contraction of the vessels and raised blood pressure which overcomes the depressing effect at the same time always produced upon the heart by reflex action, and all goes well; but when partial anæsthesia has been produced, reflex contraction of the vessels may be lost whilst the depressing reflex effect of the operation upon the heart may still remain, death from the shock of the operation following. When the narcosis is *deep*, both the reflex depression upon the heart and the reflex contraction of the vessels are absent, and the stimulus of cutting sensory nerves does not affect the heart one way or other. The operation should, therefore, never be commenced till full narcosis has been produced.

Various inhalers are used. Junker's, which prevents the vapour reaching the lung in a more concentrated form than four or five per cent., is the best; but the open sponge or towel, with the chloroform dropped on it, answers every purpose, and one dr. will be enough to begin with. No food should be allowed for five hours previously, but the plan of starving for a longer period than this is to be condemned, as it leaves patients in a bad condition to resist the effects of hæmorrhage or shock, especially those with vigorous digestive powers, who are accustomed to the stimulus of food every four or five hours.

Chloroform should always be administered with great caution, and if there be fatty or other disease of the heart the caution, should, if possible, be increased. There is hardly any state of the system in which the drug may not be used, and it may be administered at all ages, children, as a rule, bearing it well. The vomiting so often following its use may be to a great extent prevented by a previous hypodermic injection of morphine to which a little atropine has been added, or it may be relieved by inhaling the vapour of vinegar.

The last report of the Hyderabad Commission is strongly in favour of chloroform as against ether, but this decision has not been generally accepted. The reporters state "that safety is ensured by simply keeping the breathing absolutely regular all through the inhalation, and to watch the pulse is both wrong

and dangerous." Recent German statistics of nearly 400,000 inhalations show that chloroform caused 1 death in a little over 2,000 inhalations, Billroth's mixture 1 in 3,870, ether 1 in 5,000, bromide of ethyl 1 in 5,228, and chloroform-ether 1 in 7,594.

With many, the A.C.E. mixture is a favourite remedy for producing anæsthesia; it consists of 1 part of absolute alcohol, 2 parts of chloroform, and 3 of ether (S.G. ·720). Schleich recommends the admixture of chloroform and ether with petroleum ether or benzine.

Chloroform inhalation is employed for surgical operations, *puerperal* and *uræmic convulsions*, during the progress of *gall stones and renal calculi*, and largely in *obstetric practice*, in which it is most decidedly freer from danger than in any other class of cases, and the third stage of its action should never be experienced in labour unless where a difficult instrumental delivery is about to take place. The patient can be kept just upon the border of dream-land, without producing insensibility. In a host of spasmodic ailments, as *laryngismus*, *pertussis*, and *asthma*, the vapour of chloroform is highly beneficial, and it is of great benefit to the physician in carrying out the *diagnosis of phantom and uterine tumours*, and to the surgeon *in reducing dislocations*.

Internally, chloroform in small doses acts as a gastric stimulant, rapidly followed by sedative effects, probably by affecting the peripheral nerves in the same way as a pure narcotic affects the great centres. It acts in this way when given in 1 minim doses, properly diluted, and relieves *gastralgia*, *vomiting*, *sea-sickness*, and *reflex headache*. From 10 to 20 minims affect the system, causing, after absorption, marked narcotic effects, and, if repeated, symptoms resembling those following its inhalation; administered in large quantities, undiluted, it acts as an irritant poison. From its effects upon the centres of sensation it is useful as an anodyne, relieving pain, inducing sleep, and preventing spasm, and its influence is intensified when opium is combined with it, as for the relief of cough and hiccough.

Externally, chloroform applied on lint to the skin and quickly covered with oiled silk acts as an irritant, occasionally producing vesication. If uncovered or if diluted before being applied, it acts as a local anæsthetic by its influence over the endings of the sensory nerves, and hence it is useful in *neuralgia*, *odontalgia*, and *urticaria*.

Dr. Waller has shown that it greatly assists the absorption of alkaloids through the skin, the chloroform rapidly penetrating and carrying with it the dissolved substance.

The "deep injection," as introduced by Bartholow, is a valuable method of subduing *neuralgic pain*. He injects 10 minims or more of chloroform through the hypodermic needle thrust deeply into the tissues surrounding the affected nerve.

Chrysarobin, the active principle of Goa Powder, is used in chronic *psoriasis*. An ointment (of from ½ to 1 dr. mixed *intimately* with 1 oz. of heated lard or vaseline) rubbed twice daily into the scaly patches of this disease rapidly cause their disappearance. It frequently produces a painful erythematous inflammation of the surrounding healthy skin, which prevents its use in some patients. The writer, after considerable experience of chrysarobin, is satisfied that this need never occur if the application be confined exclusively to the diseased islands, *and not permitted to touch the healthy skin.* This little point he believes to be the secret of the success of the treatment. Dr. Fox has advised application of chrysarobin made into a paste with water, smeared over the spots, and covered with collodion. Traumaticine will be found even more satisfactory. Brooke's salve sticks are better still. The writer, however, finds that the best of all ways is to cover the patch with a strong stiff ointment or paste of the drug, and place upon the top of it a larger piece of Mead's rubber plaster.

Its acts both locally and constitutionally. Its local action may be seen by rubbing the ointment into the diseased spots on one side of the body of a patient affected with psoriasis. In a week or ten days the skin on the side so treated shows decided signs of improvement not in the least apparent on the opposite, and as the diseased patches begin to disappear under the direct application of the remedy, those regions to which it has not been applied eventually begin to show signs of improvement also; and the writer found, by persistently continuing the application to the spots originally so treated, the entire surface of the body cleared up. This is probably caused by its absorption into the system and its conveyance to all the diseased areas. The drug is found in the urine. The application cannot be too long continued, because an ointment which causes no irritation whatever for a few weeks, so long as the spot to which it is applied remains scaly and diseased, soon acts as a powerful irritant to the same spot as it becomes resolved and healthy.

Success has followed the internal use of chrysarobin in *psoriasis*, *eczema*, *acne*, &c., but it often produces violent griping, purging, vomiting, anorexia, and malaise sometimes after doses as small as ⅛ gr. in a pill. Chrysarobin is a powerful parasiticide, and has proved efficacious in *ringworm*, *tinea*, &c.

The deep purplish discolorations which it produces on the skin and bed linen are barriers to its use, and great care must be exercised in applying the ointment to the face, as it causes œdema of the eyelids, with discoloration, though it can be applied to the scalp (15 grs. to 1 oz.) with benefit. The discoloration can be partially removed by weak vegetable acids.

Cimicifuga enjoys some reputation as a remedy in *acute* and *chronic rheumatism;* it often is of use in cases of *muscular rheumatism*, *lumbago*, *sciatica*, &c., and has been used as a stimulating *expectorant* and in *chorea*. The drug in this country has fallen in estimation—the writer believes on account of its being kept too long, as it soon deteriorates. Large doses cause vomiting, vertigo, tremors, exudation from the bronchial mucous membrane, and a marked *diminution in the frequency of the pulse*. Small doses are said to act as a cardiac tonic, like digitalis, while large doses powerfully depress the heart, like aconite.

It acts powerfully on the uterus, like ergot, and ½ dr. doses of the tincture every two hours are recommended in *congestive dysmenorrhœa* and *retained placenta*.

Cinchona and Quinine — Cinchona differs from its alkaloids in being more astringent, 50 times more bulky, more apt to irritate the stomach, and more difficult of absorption. Quinine possesses great power as a destroyer of the life of minute organisms. Less than 1 grain dissolved in 1 ounce of water will cause the instant death of active infusoria and fungi, and double this strength prevents or checks the alcoholic fermentation and destroys putrefactive decomposition. Binz found that 1 in 20,000 (1 gr. in 46 ozs.) killed the paramecia in hay infusions in two hours, and he states that this lethal action on the lowest forms of life is peculiar to quinine.

Single large doses of quinine, or moderate doses of 2 to 5 grs., frequently repeated, give rise to a group of unpleasant symptoms, called "cinchonism"—viz., ringing noises in the ears, or deafness more or less complete, partial blindness, headache, and delirium, with nausea and insomnia. These effects, Harley believes, are produced by the direct action of quinine upon the nerve vesicles. Other observers believe that cinchonism depends upon anæmia of the brain, while it has been asserted that congestion of this organ has to answer for the symptoms. Large doses frequently repeated cause an intensification of all these symptoms, with giddiness, dilated pupils, embarrassed respiration, convulsions, paralysis, stupor, and collapse. There is diminution of blood pressure from weakness of the heart and paralysis of the vaso-motor centre, loss of reflex action from its effect upon the cord, tissue change and oxidation are distinctly lessened, and the urea and waste products are diminished, and the respiratory centre becomes paralysed.

In febrile conditions larger doses are tolerated without causing unpleasant effects. In Germany the sulphate of quinine is administered in fevers in 40 gr. doses. As much as 1 oz. has been taken without any serious results, but death has been recorded in typhoid from 60 grs.

In small doses, quinine may be taken as the type of a tonic, increasing at first the activity of the process of secretion in the stomach, but after a time checking it; and if continued too long, or if the dose be increased, the digestion and appetite become somewhat impaired, and an irritable condition of the gastric mucous membrane results.

Small doses have *no* effect on the pulse; moderately large doses (10 to 20 grs.) increase the number of pulsations, whilst slightly diminishing their power; and very large doses (40 to 80 grs.) cause cardiac depression, with great fall in the number of pulsations and in the tension.

In health, quinine appears (short of serious doses) to possess no influence over the body heat. In disease, however, full doses of the drug cause a steady diminution in the temperature when this is considerably above the normal standard.

Thus quinine ranks as an antipyretic; it is still the best and safest of all the antipyretics, and various ideas prevail as to how it acts in these *febrile* affections. Its influence over the circulation does not account for it, and it is not probable that it exercises its beneficial effects solely by its action on the heat centres. Its power to diminish fever heat is partly due to its effect in *retarding oxidation* and tissue waste, thus Binz believes that quinine in *febrile diseases* "acts by directly combating the efficient cause of the disorder, and by checking the abnormal metabolism going on in the body, the nervous system taking no part, or only a secondary part, in the operation." It is possible that quinine prevents the growth of the organisms which exist in the blood, and which are the direct cause of the febrile condition.

Quinine has been proved to possess a peculiar power over the movements of the white corpuscles of the blood, and it is supposed in this way to reduce the size of the spleen in ague, and check inflammations in their first stage.

The red corpuscles are increased in size, but are prevented from exercising their oxygen-carrying functions by large doses of this drug, and increase is observed in the quantity of nitrogen in the urine in fevers. Wilde found that full doses completely paralyse contractile tissues, larger doses still cause the tissues to pass into a state of rigor mortis, the cardiac muscle being extremely contracted.

Large doses (20 grs.) cause contraction of the gravid uterus.

In *intermittent fever* quinine cures the disease, and also affords protection to those healthy subjects exposed to the malarial poison when given in doses of 2 or 3 grs. *ter in die.* From the lethal action of quinine on amœbæ, Binz suspected that *malarial* or *intermittent* fever was produced by similar lowly organisms, because it was cured by quinine. Recent researches

have demonstrated that this is the case, and we know more about the action of this drug in the blood in disease than we know of almost any other remedy.

The parasite, or protozoon, causing the disease, grows upon the red blood disc till it increases and occupies it entirely, rapidly forming spores, which are shed in enormous numbers free into the circulating fluid, each in its turn to seize upon a blood disc and go through the same cycle over again. It is found by administering quinine, and examining drops of blood at short intervals, that the action of the remedy can be demonstrated. (See "Dictionary of Treatment"—Whitla—Third Edition, Page 459.) In the milder malarial fevers it is found that the best results are obtained if the drug be administered in a full dose (15 to 20 grs.) about three hours before the expected paroxysm, which then comes on as before, but the new generation of young spores do not develop, and there may never be another attack. The spores are most susceptible to the action of quinine, and next come the large amœboid forms. In the severe Roman fevers, which are often rapidly fatal, no time must be lost, but 15 grs. of the hydrochloride should be given as soon as the patient is seen, the hypodermic plan being selected. Bacelli gives this dose by the veins. Upon the whole it is not a material point at what stage the drug be given. It will cure all forms of the disease, and in smaller doses 3 or 5 grs. *ter in die* it should be continued after the cessation of symptoms.

In *remittent fever* quinine may be given in moderate doses during the remission, but it is advisable to give one full dose (10 to 15 grs.) at once without waiting for the remission.

Besides its use as an antipyretic remedy in *typhoid*, *typhus*, *variola*, *pneumonia*, and *acute rheumatism*, it has been employed with marked benefit in *various septic states*, and in *pyæmia* and all exhausting suppurative conditions. Weak solutions locally applied have been used in *hay fever*, *sore throat*, *whooping-cough*, and *diphtheritic ophthalmia*.

Quinine has been proved to be valuable in various forms of *neuralgia*, especially in those with well marked periodic exacerbations of pain, and in the *anæmic*, and in those suffering from prolonged worry and mental overwork. It should be given in 5 to 10 gr. doses at bed-time with a full opiate.

It has been recommended in *chronic suppurative bronchitis*, but the writer has found it often to increase the difficulty in coughing up the expectoration. It is probable that it exercises some toxic effect upon the cilia in these cases, muscles and bronchial tubes discharging the duty often silently performed by the cilia; at the same time the secretion is diminished in amount and increased in viscidity.

Quinine is used successfully in the treatment of Menière's disease in daily dosage of 12 to 15 grs.

The greater part of the quinine administered passes out of the body in the urine, the elimination lasting several days; some probably remains in the system; traces of the alkaloid have been found in the secretions of the skin, salivary glands, and intestines. Iodide of potassium solution holding free iodine affords an easy method of showing its presence in the urine by causing a brown precipitate, the reaction may be demonstrated within 40 minutes after the quinine has been swallowed.

The *infusion* is by far the best form in which to administer cinchona elegantly and cheaply. It contains a higher percentage of alkaloids in proportion to the amount of bark used. The *new official liquid extract* is a great improvement upon the older preparation. Its use has been lauded in *dipsomania*.

Quinine may be given in powder, pill, cachet, mixture, or hypodermically. When a large dose (say 10 to 20 grs.) is to be given, by far the best way is for the physician to order it to be taken in wafer-paper; 20 grs. may be folded up in a disc of moistened wafer-paper, and swallowed like a spoonful of soft food, without the least inconvenience.

Honey and tannin cover the taste of this drug.

The very soluble acid hydrochloride is a great improvement upon the sulphate, which should pass out of use entirely.

The combination of bark with a mineral acid cannot be more effectively produced than in the following excellent tonic:—

℞. *Tinct. Cinchonæ* ℥iss.
Spt. Chloroformi ℥iv.
Acid. Nitro-Hydrochlor. Dil. ℥iv.
Syrupi Aurantii ad ℥iv. *Misce.*

Fiat mistura, cujus capiat cochlear i. *minim. ex paululo aquæ ante cibos.*

Cinnamomum is a warm aromatic, acting as a true stomachic by a gentle stimulating action on the gastric membrane, increasing its secretion and assisting digestion; hence its use as a condiment. It contains a small quantity of astringent principle, which renders it useful in *diarrhœa* and *pulmonary hæmorrhage*. It also contains some principle grateful to the stomach, which often assists it in overcoming *nausea*, or even *sea-sickness*. Drummond has obtained good results in *dysentery* from a decoction of the drug. The essential oil is a stimulant, and

4 minim doses will relieve *flatulent distention*, and a smaller quantity corrects the *griping of purgatives*.

Coca and Cocaine—The action of coca leaves, or their alkaloid, when taken internally in small quantity, is stimulating like caffeine, brightening the intellectual faculties, lessening fatigue, quickening the pulse, and *raising the body heat*. In larger doses a group of symptoms like cinchonism is seen, with loss of mental controlling power, giddiness, and unsteady gait. In larger doses the hemispheres, medulla, and cord, at first stimulated, are weakened and finally paralysed. The *sensory columns of the cord* suffering, whilst the motor escape, the blood pressure falls, the temperature rises, and death results from paralysis of the respiration.

Tumas found that *direct* application of cocaine to the psycho-motor centres of the dog invariably produced a fall of their excitability, and when painted over the cerebral cortex prevented epileptic fits. Large doses by affecting the semicircular canals caused peculiar motor disturbances.

Kochs has demonstrated its power of preventing the transmission of sensory stimuli by directly applying it to the sciatic nerve of the frog. After repeated applications the *motor* fibres in the nerve were also finally paralysed.

A few drops of a 4 per cent. solution deprive the conjunctiva of all sensibility, so that squint, cataract, iridectomy, and even the operation of removing the eyeball can be painlessly performed; the range of accommodation is shortened and the *pupil dilates*.

The same effect is produced when applied to the mucous membranes of the nose, mouth, palate, pharynx, larynx, vagina, os uteri, anus, and rectum. Solutions of various strengths have been used, 4 per cent. for the eye and 5 per cent. for the nose, mouth, and larynx ; and $\frac{1}{4}$ gr. injected into the neighbourhood of buboes, inflamed bursæ, small tumours, abscesses, &c., permits them to be painlessly dealt with. Murrell has obtained good results by an inunction of 20 per cent. in oil of cloves over the course of neuralgic nerves. Owen, by mixing an 8 per cent. solution with the official atropine solution, obtains an effective remedy for all *painful and inflamed conditions* of the *conjunctiva* and *cornea*, and Dr. Bradford finds by adding $\frac{1}{2}$ gr. of pilocarpine to 1 dr. of a 4 per cent. solution of cocaine that all the anæsthetic effect is produced without affecting in the slightest degree the accommodation. The hypodermic injection of $\frac{1}{2}$ to 1 gr. relieves and sometimes cures *neuralgia*, and enables the surgeon to perform minor operations painlessly.

Whilst it is generally accepted that the local effects of cocaine are owing to its influence upon the sensory terminals, it has been suggested that the anæsthesia is the result of a local anæmia of vaso-motor origin.

For *hay fever*, *pruritus* of the *anus* and *labia*, *vaginismus*, *fissure* and *ulcer* of the *anus*, its use has been followed by relief, and it gives good results in aural practice also.

Cocaine is antagonistic to morphia, ether, chloroform and chloral, and Obalinski recommends as the safest anæsthetic a combination of cocaine and chloroform; the cocaine being injected locally and the chloroform being given by inhalation. Many alarming symptoms have followed the injection of even small quantities of the drug. The liquid extract of the leaves is a valuable tonic, stimulant and restorative in various forms of *nerve exhaustion*, and some believe that it is a cardiac tonic like digitalis.

A condition known as cocainomania results from the prolonged administration of the drug—there is emaciation, quick pulse, loss of memory, sleeplessness, and delusions, for which nux vomica and strong coffee have been recommended. Magnan has pointed out a valuable symptom of cocaine poisoning, viz., the patient complains of feeling foreign bodies under the skin in different parts. Sand, pebbles, crystals, worms, &c., are complained of, and the symptom is stated to be diagnostic.

Coccus—The cochineal insect and its preparations are simply colouring agents, there being no reason to think that tincture of cochineal has any effect whatever in *whooping-cough* or other *spasmodic affections*. Its beautiful carmine colour is turned purple by alkalies.

Codeina possesses feeble narcotic powers. Brunton found that it expended its force upon the nerves of the *viscera*, whose irritability it lessened to such an extent "that after its administration, irritant poisons like arsenic produced neither vomiting nor purging." It increases the irritability of the spinal and cerebral motor centres. Owing to its power over the visceral nerves it has been found very useful in soothing *the cough of phthisis* and relieving *visceral neuralgias*, and in lessening materially the amount of sugar in the urine in *diabetes*, in which disease it acts like a weak morphine preparation.

It has been given with advantage in sleeplessness caused by pain in some peripheral regions, and in nausea, where 1 to 2 grs. may be given every 4 or 6 hours till sleep is produced.

Colchicum in small doses by the mouth or hypodermically increases the secretions of the stomach, intestines, and liver. In large doses, vomiting, purging, tenesmus, and inflammation result, and death occurs from irritant poisoning—the sensory nerves being paralysed, while the motor nerves are but very slightly, if at all, weakened.

As a diuretic its action is most uncertain, and as a purgative

its effects are too severe. Well-marked sedative influence on the heart and general circulation follows its administration, though this is largely reflex.

In *gout*, striking effects follow its administration, pain subsiding promptly, swelling disappearing, and the attack often vanishing after one or two doses. Some, however, believe that it is in no way curative, the relief being dearly bought, the pain returning with greater severity.

How it acts in these cases of *acute gout* it is not easy to explain, but we know it is not by exerting its purgative or questionable diuretic properties, since its good effects are constantly seen without either catharsis or diuresis being produced, though it acts better in conjunction with purgatives. It does *not* increase the amount of urea or uric acid in the urine.

Paris noticed that alkalies softened its action, while acids rendered the drug more irritating. Magnesia makes a favourite corrective. The wine of colchicum is the best preparation for ordinary administration.

It has been advocated in all the protean forms of gout, and in almost every disease occurring in gouty persons. 15 minims of the wine may be given every 4 or 6 hours. The same plan may be adopted in the acute variety of the disease, though a full dose, say 1 dr., of the wine may be given, and repeated in two, three, or four hours while pain lasts.

Colchicum, from its stimulating action upon the liver, may be given advantageously with other *purgatives*, and the addition of a few grains of blue pill and colocynth makes a very valuable purgative for gouty patients.

The following is a modification of Scudamore's mixture :—

℞ *Vini Colchici* ℥iv.
Magnesii Sulph. ℥j.
Magnesii Carb. ℥ij.
Aq. Menth. Pip. ad ℥xij.

Fiat mist., sumat cochlearia duo ampla quartis horis, p.p.a.

Collodium and **Collodium Flexile** are only intended as external applications. When a little is brushed or dropped upon the skin the ether evaporates, leaving behind a thin film impervious to moisture. This contracts as it becomes more solid, until it puckers up the surrounding skin, and, by its pressure, partly empties the vessels of the part. It is generally used as a protective coating for *fresh wounds*, excluding air and

all external sources of irritation, putting the wound almost in the same condition as an internal part, thus hastening repair. It is, however, used for its contractile properties in the treatment of small *nævi*, *port-wine marks*, *entropion*, &c., where it both diminishes the blood in the cutaneous vessels and gives support. M'Keown paints it upon the *relaxed membrana tympani*.

It is found that a layer of collodion possesses *electrical* properties, and thus affords a method of producing feeble doses of static electricity—the film is *negatively* charged as soon as it dries, and it has been used to relieve *hemi-anæsthesia*.

The flexible collodion does not contract so much as the other, but is less liable to crack with the movements of the skin. It is an excellent application to *erysipelatous* surfaces. Corrigan recommended it as a remedy for *nocturnal incontinence of urine*, painted over the child's prepuce at bedtime ; and it has been successfully used to cover the face in *smallpox* to prevent pitting, and as an application to *fissured nipples*. It is the best treatment for *scalp wounds*—incised, lacerated, and contused. As it dries, by its contractility it draws the edges of the wound together, prevents the admission of air, and does away with the necessity of a bandage. Collodion has been recommended as an application to sprains, and especially where the sprain is complicated with an open wound. It may be used to paint over the painful joints in rheumatism. The vesicating collodion is an excellent blister.

Colocynthis is an active purgative, causing copious watery motions ; it enters the blood, from which it is eliminated by the intestinal glands, which it stimulates, increasing their secretion, and hastening the vermicular contractions of the bowel, making them painful and irregular. In large doses it acts as a violent irritant to the canal, and may excite fatal inflammation or disturb the functions of the abdominal organs by reflex action, producing abortion, cystitis, &c. It is seldom given alone, but is a valuable addition to aloes and scammony.

Extract of hyoscyamus relieves the griping caused by colocynth, without detracting from its purgative properties. The compound pill is a valuable purgative in *constipation of long standing*. It acts like aloes on the colon and (in full doses) on the liver, and it is feebly diuretic.

℞. *Pil. Colocynth. Co. gr.* iv.
Ext. Hyoscyami gr. ½.
Ext. Belladonnæ Vir. gr. ⅓.
Resinæ Podophylli gr. ¼. *Misce.*
Fiat pil. mitte tales xii. *st.* i. *nocte.*

Conium—The researches of Fraser demonstrate that the discrepancies in the results of the various observations on the action of this drug are owing to the presence of methyl compounds of coniine in the different preparations experimented with.

Hemlock has no action upon the intellectual faculties, the physiological effects begin to show themselves within half an hour after swallowing half an ounce or an ounce of the succus. Vision becomes a little affected by a paralysing influence on the third nerve, which causes slight drooping of the lid, slight dilatation of the pupil, and impaired movement of the eyeball, followed soon by general diminished motor power, as is seen in a wearied, unsteady gait. If a larger dose be now administered, the diminution of motor power is intensified, and the patient is unable to move, the knees bend on standing, the pupil becomes more dilated, and the vision gets more confused.

Still larger doses produce complete paralysis of the *extremities of the motor nerves* extending along their trunks to the motor centres, swallowing and phonation become impossible, and finally death occurs from asphyxia through paralysis of the respiratory apparatus. Owing to the varying amounts of coniine and methyl-coniine present in different samples of the drug its action is variable, the last named principle causes paralysis of reflex action.

Hemlock has been used in *mania*, *chorea*, and *paralysis agitans*, its value depending on its depressing influence over the extremities of the nerves distributed to the restless muscles. In *whooping-cough* it is also serviceable; in *tetanus* its value is doubtful.

In spasmodic affections, like *laryngismus* and *convulsions* occurring during *dentition*, hemlock may be useful, but it must be administered very freely. The only reliable preparation is the succus, which should be given in doses of 2 to 4 drs. every 3 or 4 hours, and little benefit may be expected till the physiological effects of the drug are noticeable—a slight disturbance of vision and gait. Ringer gave 7 drs. hourly to a choreic child, and children can bear large doses well as a rule. A child one year old should get more conium in proportion than an adult; 10 minims to begin with is a maximum dose of the succus. It should, however, be rapidly increased, watching the effects. When any difficulty of swallowing is observed, the use of the drug should be suspended.

Hemlock is said to cause the absorption of *effused inflammatory* products; and formerly it was classed on this account as a *solvent*, *deobstruent*, or *absorbent*.

Externally, conium is a sedative. The writer, after repeated failures with cocaine and a host of local anæsthetics in the relief

of rectal pain and itching, caused by *anal fissures*, found that an ointment of conium always gave relief, 10 grs. of the persulphate of iron may be added to each ounce in suitable cases, as recommended by Cripps. The B.P. authorities having accepted the author's formula, the ointment is now official. It paralyses the endings of the *motor* nerves distributed to the fine muscular layer under the surface of the mucous membrane ; the reflex twitchings of this layer keep up the perpetual pain and uneasiness in diseases of the rectum and anus associated with abrasions, ulcerations, or fissures. At the same time the sensory terminals are paralysed.

This will be found by far the best remedy for the pain of *fissures* and *ulcerated hæmorrhoids*, and the writer has seen anal fissures heal under its use. It should be inserted well up into the bowel. It speedily relieves all forms of *anal pruritus*, and it may be prescribed of double the B.P. strength.

Copaiba acts as a mild irritant to the stomach, and in large doses excites nausea, vomiting, griping, purging, and sometimes strangury, with bloody urine. It acts on mucous membranes chiefly, and it is mainly for its effect upon the urethra that it is used in medicine.

Given in *gonorrhœa*, it at first slightly increases the flow, and afterwards controls it. It should not be given in the early or acute stages. It should not be given in larger doses than 30 minims, and often this dose upsets the stomach. It may act by destroying the specific poison which causes the inflammation. It is eliminated by the kidneys as glycuronic acid, which gives a precipitate with nitric acid, which is soluble by heat ; and it is eliminated also by the bronchial membrane and skin—all of which excretory organs are stimulated by it. It increases the watery element in the urine, and is used sometimes as a diuretic in dropsies of hepatic origin, but it may produce albuminuria, and is very irritating.

It acts by direct contact in *gonorrhœa* and *gleet*, and the writer has found benefit from injecting it into the bladder in *inveterate cystitis* in the female. He dilutes it with its own bulk of warm castor oil, and injects 1 oz. of it, allowing it to remain until expelled.

In *chronic bronchitis*, with profuse expectoration, copaiba often acts splendidly, and will be found in such cases the most reliable of the oleo-resins. It is occasionally used in *leucorrhœa*, and has been known to remove *psoriasis* which resisted all remedies. Its administration sometimes brings out a profuse rash not unlike measles, or urticaria, and this probably gives some explanation of its use in psoriasis, acting as a stimulant to the skin. It may be given alone, in water, or in the form of an

emulsion with mucilage, egg, or liquor potassæ, or in a gelatin capsule, or better still, as a paste. (See under Cubebs).

(Gonorrhœa Mixture.)

℞. *Copaibæ* ℥vj.
Liq. Potassæ ℥iv.
Mucilaginis ℥j.
Spt. Æther. Nit. ℥iij.
Aquæ Cinnamomi ad ℥viij. *Misce.*

Fiat mist. capiat cochlear. i. *mag. ter in die, p. p. a.*

Coriandrum—An aromatic carminative, identical in its effects with Anethum and Anisum. 4 minims of the oil may be given on sugar, for *colic.*

Creosotum possesses many properties in common with Acid. Carbolic. (which see). It is speedily absorbed on entering the stomach, and does not undergo any marked change in the blood. It is eliminated by the bronchial mucous membrane, which it stimulates, thus becoming an expectorant especially valuable if there be any fetor of the secretion, as in *chronic basilar cavity.* It is the best of all agents in ordinary *phthisis.* It may be given by the mouth, hypodermically in oil, by the rectum, applied with friction to the skin, or sprinkled on an inhaler; or in all these ways at once, constituting the so-called "intensive" method, and up to 30 minims daily may be administered. Harry Campbell states that he has given drachm doses *ter in die* without any inconvenience. (See also Guaiacol.) It also passes off in the urine, and is believed by some to be diuretic, and the writer has found it valuable where the urine is foul smelling. He has kept samples of urine exposed to the open air without change for 14 days from patients who had been taking creosote. Recently V. de Holstein extols the drug as a certain remedy for *chronic constipation*, in daily doses of 1 or 2 minims, increased to 7 or 8 in wine and water. In very large doses it is a violent irritant poison, resembling carbolic acid, only it does not produce convulsions, and does not render the blood less coagulable.

Small doses have a sedative action upon the terminal nerve filaments distributed to the gastric mucous membrane, and correct *nausea*, *gastralgia*, and *vomiting*, whether caused by local mischief or of a reflex character, as in *sea-sickness* or *pregnancy.* 2 or 3 minims frequently arrest *fermentative* and *putrefactive changes in the stomach*, for creosote, like carbolic acid, is a powerful antiseptic. It may be given in pill, or dissolved in

cod liver oil, or in a mixture, and it is to be remembered that it explodes when combined with oxide of silver in the pilular form, unless it is previously diluted with some inert powder. But the gelatin capsule is by far the best form for its administration. In *tuberculosis* the drug may be given in doses up to 15 minims per rectum, mixed with 2 or 4 oz. emulsified cod liver oil. Splendid results have been reported by Thomas and others from this plan in tubercular peritonitis. Externally, it acts like carbolic acid, and relieves the pain of an *exposed dental nerve* effectually; and in the form of the ointment it is useful in *ulcers* and the *scaly skin diseases* where tar is indicated, and it relieves the itch of *eczema*. As an inhalation in *chronic bronchitis* and *gangrene of the lung*, creosote is beneficial. In tuberculosis it probably combines with and neutralizes the poison produced by the bacilli.

Creta and Creta Præparata are mild antacid remedies, useful where we wish to reach the *intestinal* surface with an alkali. (Their action is explained under Calcium Carbonate). The aromatic powder is a valuable remedy in the *diarrhœa of childhood;* it may be given as a powder or in a mixture.

(For a child 4 years old.)

℞. *Pulv. Cretæ Aromat.* ℥ij.
Syrupi Simplicis ℥j.
Spt. Chloroformi ℥j.
Aquæ ad ℥iij. *Misce.*

Fiat mist. sumat cochlear. i. *minim. tertiis vel quartis horis, p. p. a.*

Crocus—Saffron may be said to be only used for its colour and flavour. It was much esteemed long ago as an emmenagogue, and was believed to possess the property of increasing the rash in the *exanthemata*.

Crotonis Oleum is a powerful drastic or irritant cathartic, causing copious watery motions often in less than one hour after a medicinal dose. It does not act entirely as a local irritant to the intestines, as was supposed, but a part of it may be absorbed, and entering the blood, circulates with it till it reaches the intestinal glands, which it stimulates to increased action, and it quickens the peristaltic movements. The same effects are sometimes said to follow its application to the skin with friction as are observed after swallowing it. In large doses it is a violent poison, acting as a local irritant, and causing inflammation of the digestive tract, or death from collapse. Its rapid action

renders it a valuable purgative, where time is a consideration, as in *head injuries*, *acute mania*, *delirium tremens*, and *brain disease*, and in very *obstinate constipation*, when we are sure the lower bowel is freed by enemata. It may be given in pill, 1 minim acting as an efficient cathartic; or in *apoplexy*, it may be dropped on the tongue, when power to swallow is blunted or lost. (This is not, however, to be recommended). It may, in such a case, be rubbed up with about 5 grs. of sugar, or a little butter, and placed on the root of the tongue.

Externally, croton oil is a strong irritant when applied to the skin, bringing out an eruption, at first papular, but soon passing into pustulation. It is not, however, as painful a counter-irritant as might be expected. The linimentum crotonis cannot be improved upon where the drug is indicated as a rubefacient, and it will be found useful as an external application in *acute bronchitis*.

The local application of croton oil to *ringworm of the scalp* has been successful in the hands of some, but it is stated that it produces baldness.

Cubeba resembles Copaiba in its action, and possesses a stimulating and alterative influence over the genito-urinary mucous membrane and rectum. It may be used in the early stage of *gonorrhœa*. Made into a paste with copaiba, and a little nitrate of potassium added, it can be bolted in wafer paper in doses the size of a hazel-nut. The same paste will often give relief in *bronchitis with profuse expectoration*, when other measures fail; and it is an excellent remedy for *piles*, if made into a paste with *glycerin*, and bolted in a similar way.

(*Gonorrhœa Paste.*)

℞. *Pulv. Cubebæ* ℥ij.
Pulv. Potassii Nit. ℥ij.
Pulv. Doveri ℥ss.
Copaibæ q.s. ut fiat

electuarium durum, ℥i. *ter die sumendum post cibos.*

Cupri Sulphas given in small doses (½ grain) acts somewhat like the lead and silver salts. It has nervine tonic properties, and has been given in *epilepsy*. It is a strong astringent, and is used in chronic *diarrhœa*. In larger doses (5 to 10 grs.) it is a speedy emetic, acting like sulphate of zinc, in formidable *poisoning* cases, especially in phosphorus poisoning, and in

larger doses it is a powerful irritant poison, producing paralysis of the respiratory and cardiac centres.

It has been recommended in the treatment of *typhoid* fever.

Externally, it is a valuable astringent, appreciated in veterinary practice, and the solid salt rubbed over *sluggish sores* destroys unhealthy granulations, and it is a powerful local stimulant. 3 grs. to 1 oz. water make a lotion which may be applied to *chancres* and *ulcers ;* or injected into the urethra in *gleet ;* or into the vagina in *leucorrhœa ;* or brushed over the lids in *ophthalmia.*

Its prolonged administration stains the gums or teeth with a blue or green line like that seen in *lead poisoning.* It is eliminated by the skin, kidneys, mucous membranes of the gall, bladder, stomach, and bowel, and is stored in the liver.

Cusparia is a tonic possessing aromatic and febrifuge qualities; in large doses it causes vomiting and purging, but in medicinal doses (30 grs. of the powder) it is useful in the *fevers of the tropics* and in *dysentery*, though it is almost devoid of astringency. It is useful in some cases of *intermittent fever* where cinchona or its alkaloid cannot be borne.

Cusso, when taken in large doses, sometimes causes both vomiting and purging. It kills *tænia solium* and *bothriocephalus*, for in the doses usually given it does not often purge, but kills the parasite by direct contact.

2 to 4 drs. of cusso infused in 4 ozs. of boiling water, and swallowed without straining, are taken for one dose ; and, like all other vermicides, it acts more certainly if given when the stomach and intestines are empty, and if followed soon after by a mild purge ; the worm is expelled dead, and often in small fragments.

Digitalis is a true cardiac tonic. Small doses lengthen and strengthen the ventricular contractions, raise the blood pressure and slow the pulse by stimulating the vagus roots, and the peripheries of the cardiac nerves. Moderately large doses increase the frequency of the pulse by paralysing the vagus roots, the blood pressure still rising. Larger doses cause irregularity of the heart's action and pulse by their effect upon the heart itself, and if the doses be repeated the blood pressure falls and the heart becomes finally paralysed, the respiration previously having been also weakened, though the motor and sensory nerves, cord and cerebrum remain unaffected. These results may be summarised by adopting Schmiedeberg's method of dividing the action of digitalis into 4 stages, thus :—

1. Increase of cardiac pulsation, slowness of pulse, and rise of blood pressure.

2. Quickness of pulse (effect on cardiac vagus filaments), continued high blood pressure, and increase of urine.

3. Irregularity of heart and pulse (effect on cardiac muscular fibre).

4. Increased irregularity and weakness of heart and pulse, fall of blood pressure, failure of heart and respiration, and death.

In the treatment of disease the drug should not be pushed beyond the 1st stage. Brunton asserts that the main cause of the increased blood pressure is not to be accounted for by the increased action of the heart, but by the *contraction of the arterioles* throughout the body. It acts as a diuretic mainly by raising the blood pressure in this way; its diuretic action is, however, slight in health but marked in heart disease.

Digitalis, on account of its strengthening action on the heart, may be given in all cases of *weakened contraction from valvular disease except one*. It acts in valvular disease by slowing the heart's movements, so that the overburdened ventricle or auricle gets longer time to contract, and thus more effectually drives the blood through a narrowed orifice. In the case of *mitral obstruction* the time during which the blood flows from the distended auricle into the ventricle is increased, and when the former contracts it has less to expel, and hence does its work better. The exception to its use is in the *early stage of aortic regurgitation*, where, after each contraction of the heart, the blood, which should be forced along the aorta, finds its way back into the wearied ventricle, breaking upon its repose. If the diastole is prolonged by the digitalis, the duration of this backflow is increased, the mischief is aggravated, and grave danger may result. Later on, however, when the pulmonary circulation is affected, and through it the right ventricle becomes implicated, digitalis may afford relief.

Sansom lays down a law which should never be forgotten—that all agents which increase the force of the systole are *invariably* hurtful in aortic disease without cardiac symptoms. It should not be given in extensive atheromatous disease of the vessels, nor when there is much fatty degeneration of the heart muscle. Ringer points out that "the irregularity of the pulse is the capital indication of the necessity of giving digitalis," and it is often valuable in palpitation and irregular action of the heart not depending upon valvular disease.

Sansom says: "Digitalis is *facile princeps* of drugs in the treatment of imperfect compensation. It so influences the cardiac ganglia as to induce a more perfect contraction of the ventricular muscle, and hence a more complete emptying of the ventricles; whilst, at the same time, by an action on the vaso-motor centres, it causes contraction of the arterioles and a heightened tension in the arterial system. It slows the heart by

lengthening the diastolic pause ; so not only does it give rest to the wearied cardiac muscle, but as this muscle is nourished only during such diastolic pause by the blood which then enters through the coronary arteries it directly ministers to its nutrition."

By a valuable research of Hare's, it has been demonstrated that digitalis administered to young pigs for 4½ months caused a genuine hypertrophy of the cardiac muscular fibre and increase in the weight of the heart, the increase corresponding to the extra growth in each fibre.

½ oz. doses of the tincture have been used in *delirium tremens ;* this is not a method of treatment to be recommended. It reduces the temperature in *inflammatory conditions*, and as an antipyretic is still occasionally used on the Continent. In *pneumonia* the drug is valuable when combined with other treatment. Petresco gives from 60 to 120 grs. of the leaf in infusion in 24 hours, and states that he has never seen poisoning, and his mortality is only 1·22. Others insist upon the grave danger of such doses.

It is used in *internal hæmorrhages*, because of its influence in contracting the arterioles, but it is very uncertain. It causes contraction of the *uterine muscular tissue*, and is useful in *menorrhagia.*

In disease, the diuretic effects of this drug are often astounding. Given to relieve the *kidneys*, where many quarts, or even gallons, of fluid are shut up in the peritoneal cavity or thorax, from an obstructed cardiac circulation, it has been seen to increase the scanty urine from several ounces to as many pints in twenty-four hours. In these cases it acts by striking at the cause of the dropsy, through its power of raising the blood pressure in the renal glomeruli. Kobert shows that *Digitalin* contracts *all* the vessels, and *Digitoxin* and *Digitalein*, whilst also contracting all the other vessels, dilate those of the kidney. Hence *tincture* of digitalis, which contains the three substances, is the best diuretic preparation of the drug. These substances also exist in the *infusion*, though in smaller proportions ; it contains much *Digitonin*, which is antagonistic to the others ; it is, however, by some preferred where cardiac tonic effects are desired, but this is probably a mistake as it contains almost no Digitoxin. The tincture may be used for all purposes with advantage, though it may possibly be inferior to the powdered leaf.

After the disappearance of the dropsy it has very slight power of increasing the amount of water or urea eliminated.

Digitalis, when administered for some time, occasionally without warning, produces symptoms of poisoning as if one large and dangerous dose had been taken. This is spoken of as the *cumulative* action of the drug, and it arises from its elimination

by the urine being retarded. When the blood pressure rises very high the excretion of urine stops and the drug consequently accumulates rapidly in the blood. This may be prevented by keeping the patient strictly confined to the recumbent position, watching the urine and stopping the administration when the secretion becomes scanty.

Marshall has drawn attention to the great benefit which may be obtained by combining the antagonistic action of the nitrites with digitalis in cases where the blood pressure is high. It must not be forgotten, however, that the action of the digitalis is almost continuous, whilst that of the nitrite is very evanescent.

Externally, an infusion applied to any extensive surface is sometimes absorbed.

Baly's or Guy's pill, which usually is made to contain 1 gr. each of powdered digitalis, squill, and blue pill, is a favourite diuretic in *cardiac* dropsy.

Niemeyer's pill, much used in *phthisis*, contains ½ gr. digitalis, 1 gr. quinine, and ¼ gr. opium; and Heim's pill is the same with the addition of ¼ gr. ipecac.

Iron, though incompatible with the tannin in digitalis, is often prescribed with advantage; the following formula gives a clear elegant mixture:—

℞. *Tincturæ Ferri Perchlor.* ℥iij.
Tincturæ Digitalis ℥ij.
Acidi Phosphorici Dil. ℥iij.
Aquæ Destillatæ ad ℥viij. *Misce.*

Fiat mistura, sumat ℥ss. *ter in die ex aqua post cibos.*

Elaterin and Elaterium—The latter is only used to prepare elaterin, which is the most violent purgative known. Belonging to the hydragogue class, it produces profuse watery evacuations by its stimulating and irritating action on the liver and intestinal glands, by which it is eliminated. Externally, it is a strong irritant to moist surfaces.

In the treatment of desperate conditions—like *apoplexy*, &c.—$\frac{1}{10}$ grain will draw off as much water and serum from the blood as a copious blood-letting. The $\frac{1}{20}$ grain is a good average dose, and, owing to the discharge of water produced by it, it is useful in *dropsies*, or in accumulation of fluid from any cause especially where the kidneys are congested or fail to do their office, and the heart is not too weak. Its great use lies in its application to cases of formidable and *sudden anasarca* threatening life by its rapidity, as in *œdema of the lung*.

5 grs. of the compound powder, put on the tongue and washed down with a spoonful of water, should purge in a few hours.

It requires bile for its purgative action ; if injected under the skin, Brunton says it produces *dyspnœa* and *tetanus*. The student should note the dose of elaterin—$\frac{1}{20}$ grain—while elaterium may be given in 10 times this quantity. The writer has sometimes found elaterium to fail completely even in large doses. It is uncertain in its action, and must not be always relied upon.

Emplastra—The B.P. plasters are chiefly used for their physical quality of adhesiveness. By strapping so that a grip can be obtained on the surrounding elastic tissues, considerable pressure can be constantly kept up, and in this way *inflammatory products* may be absorbed, especially if of *syphilitic* origin, the ammoniacum and mercury, or the mercury plaster, answering this end very well. *Pain* may be relieved by the menthol, belladonna, or opium plasters, while feeble counter-irritation and active rubefaction may be produced by calefaciens and cantharides respectively.

With the exception of cantharides, all the plasters promote the absorption of superficial inflammatory deposits by protecting the part from variations of temperature. By checking evaporation the local temperature is increased, and the superficial part partakes somewhat of the benefits of an internal position, and glandular and lymphatic action become altered, as is seen in the resolution of *chronically inflamed glands and joints*.

Ergota, owing to the complex nature of the various active principles contained in ergot and the great difficulties in isolating them, experiments conducted with them have led to confusing and contradictory results. It has been noticed that where ergot has been taken for any time in the rye-bread used by peasants, *gangrene* and *paralytic symptoms* have supervened, though these are rarely seen after the prolonged medicinal use of the drug. Large doses of ergot cause vomiting and purging, paralysis of the sensory nerves, inco-ordination, muscular spasms and convulsions, and death through paralysis of the respiratory centre.

In moderately large doses ergot causes contraction of the involuntary muscular fibre throughout the body, the arteries and veins diminish rapidly in calibre, and the vessels of the spinal cord are more especially contracted ; there is a fall in arterial pressure, soon followed by a marked rise, but this rise does not occur in poisonous doses. The heart is little affected by moderate doses, though the pulse falls a little, but the uterus is powerfully influenced.

Ergot is used in *internal hæmorrhages*, 20 minims of the liquid extract every three hours relieving *hæmoptysis* by constringing the small vessels. In *urgent* cases the same amount may be injected under the skin every fifteen or thirty minutes. It is useful in all *hæmorrhages*, and sometimes, by acting upon the muscular walls of the intestines, it stops *diarrhœa*. The hypodermic injection of ergotin has proved effectual in curing *goitres* and *aneurisms* when injected into the tissue surrounding the sac. It is useful in *purpura* and excessive *sweating*, in *dysentery*, *enlargement of the spleen*, and *congestion of the spinal cord*.

It is, however, in *obstetric practice* that the virtues of ergot are appreciated. By acting on the uterine fibres it produces powerful tetanic contraction, and assists to expel the contents of the organ. 30 grs., infused for ten minutes in boiling water, will often arouse the slumbering energies of the uterus within five or ten minutes, but its administration requires discrimination: thus, it should not be given if there be any impediment to the descent of the head, or if the pains are already good; and sometimes it exerts dangerous pressure upon the child by its tonic action on the uterus, and it may weaken the fœtal heart.

It may cause irregular action of the muscular tissue ending in retained placenta. It acts proportionately to the size of the uterus. In the early months of pregnancy it feebly affects the organ, but its power over it increases with every month of gestation. It is the best remedy we have for the relaxed condition, causing *post-partum* hæmorrhage, where it may be given in dr. doses, or 10 minims of the hypodermic injection may be injected *deeply* into a muscle or into the uterine walls in desperate cases. *Subcutaneous* injection is more likely to be followed by irritation and abscesses. The obstetric practitioner will find the fresh infusion the best preparation, and where he resides a long way from his patient, it is a good rule to never leave a recently-delivered case without previously giving ergot. Good results follow its use in *sub-involution* and *menorrhagia*, and various forms of *uterine fibroid tumours*. For *fibroids* Schucking injects ergotin into the lip of the os uteri. Most authorities agree that the abdominal wall must not be selected, and that the deep muscles of the buttock afford the best spot. The solution should be always freshly prepared.

In *prolapse of the rectum*, Vidal injects 3 grs. ergotin into the sphincter or prolapsed bowel every two or three days.

Eserine (See under Physostigma.)

Ether (See under Æther.)

Eucalyptus Oil is a powerful antiseptic, destroying minute organisms. In some respects its action resembles quinine, thus

it arrests the movements of the white corpuscles and causes the spleen to contract. In large doses it paralyses the brain and cord, causing death generally by its action on the respiratory centre. Externally it is a rubefacient, and if covered with oiled silk it will blister. It is given in feverish septic conditions, and good results have followed its use in *puerperal fevers*, *pyæmia*, and *septicæmia* in 5 minim doses. It reduces the temperature, and has proved curative in *ague*, and during its elimination by the bronchial mucous surface and the renal tract, it is a disinfecting remedy in *phthisis* and *bronchitis* and in *cystitis* and *gonorrhœa*. It has been given hypodermically in liquid vaseline. Many physicians are now treating all the *exanthemata*, *pertussis*, and *diphtheria* by enveloping the patient in an atmosphere of eucalyptus vapour. In *influenza* this has become the popular practice. Gurgenven has obtained excellent results from this method of treating *scarlatina*.

Locally the vapour has been used as an inhalation in *gangrene of the lung*, *phthisis*, *ozœna*, *diphtheria*, and a dilute solution is employed to wash out cavities and *irrigate foul wounds*. Made into a pessary, it has been used in *cancer of the uterus and rectum*, and as a gauze it is used as an antiseptic surgical dressing.

Eucalyptus gum is an astringent acting like catechu and tannin in *diarrhœa*, *dysentery*, &c. It is used also for *relaxed throat* and in *hæmorrhoids*.

Euonymus and the dry extract known as Euonymin are cholagogues increasing materially the excretion of bile. It is a reliable cathartic, in some respects resembling podophyllin, but very much milder in its action. The experiments of Rutherford proved that it increased the amount of bile flowing into the intestine of dogs. Its chief indication is in *torpidity of the liver* in stout patients, who live too well. In the early stages of *cirrhosis* it is useful, and some cases of *chronic constipation* yield to 1 gr. doses twice a day. 5 grs. may be given as a brisk purge, followed, if necessary, by a saline.

Fel Bovinum is employed in medicine where there is reason to suspect that the natural secretion of bile is deficient; the bile is known to assist the emulsification of fats, to act as an antiseptic and purgative, and to facilitate the absorptive powers of the mucous membrane. It may be given in 15 gr. doses as a bolus, or wrapped in wafer-paper.

Ferrum—Iron must to some extent be considered as a food, though in medicinal doses in health it does not increase the number of the red corpuscles. It increases the appetite somewhat, and if the astringent preparations be administered constipation results; in any case the stools are black, and sometimes the bladder is irritated. None of these effects throw

any light upon the action of the drug in disease. It is, beyond all doubt, a most valuable tonic to the whole system. It directly affects the blood in *anæmia*, increasing the red corpuscles, and thus enriching nearly all the tissues with an increased supply of oxygen. The brain and nervous system benefit by its ozonising properties; their tone rapidly improves, and hence its great value in *exhaustive mental overwork* and *neuralgia* where iron is a tonic in the true sense of the word. In recovery from *fevers*, especially in cases where there has been *much brain activity* or *prolonged delirium*, the use of iron is often attended with the best results.

Iron acts by combining with the hæmoglobin of the corpuscles, and under a course of iron rapid improvement in the condition of the blood may be demonstrated every few days by the use of the microscope.

The soluble salts of iron are absorbed as chlorides probably in large amounts, and are, after passing through the liver, eliminated by the bile and by the intestinal secretion. They pass out by the fæces in almost as large amount as when swallowed, hence some authorities believe that the iron salts are not absorbed at all and never find their way into the blood.

Bunge maintains that in *chlorosis* the inorganic iron administered does *not* go to form hæmoglobin, but simply protects the iron in the food from being converted into inert sulphide in the bowels. The vexed question of how iron acts may be said to be now settled by the able researches of Stockman, who has demonstrated that the metal is absorbed. He obtained striking results in *chlorosis* by the hypodermic injection of small doses of the ammonio-citrate, and he has proved the fallacy of Bunge's theory by curing anæmia with the supposed inert sulphide. The writer believes that some of the good effects of iron are obtained by its action on the liver. When the object is to saturate the system with iron the non-astringent preparations should be selected, as Blaud's pill, reduced iron or the dialysed liquor, though Ringer insists upon the superiority of astringent salts like the sulphate and perchloride in small and frequently repeated doses. Lepine strongly advocates the hypodermic use of $2\frac{1}{2}$ c. c. of a 4 per cent. solution of the citrate into the buttock.

It would occupy much space to mention the ailments for which iron is so highly praised, but many will be included by saying that in *anæmia*, from whatever cause, this drug may be freely given. It seems to possess specific power over *erysipelatous inflammations* when taken in large doses, and in *chlorosis* and *scrofula* its effects are nearly as evident.

Externally, the perchloride is a powerful astringent, and the strong solution acts upon the blood-vessels, and hardens the

tissues. It is a valuable last resource when injected into the uterus in *post-partum* hæmorrhage, if reduced to about the strength of the diluted solution of the B.P. The solid crystalline mass obtained by evaporating the liquor can be easily carried in the obstetric bag and on adding it to water (1 to 10) may be injected into the uterus.

The scale preparations are favourites, especially the citrate with quinine, which, however, cannot be ordered with alkaline carbonates.

℞. *Ferri et Quininæ Cit.* ℥ij.
Spiritus Chloroformi ℥ii.
Inf. Calumbæ ad ℨx. *Misce.*

Fiat mist. st. coch. i. *mag. ter in die.*

The citrate may be given in effervescence, and makes a most elegant and palatable chalybeate mixture.

℞. *Ferri Ammon. Cit.* ℥ii.
Acidi Citrici ℥iiss.
Aquæ (or *Aquam*) *Destil. ad* ℨvj. *Misce.*

Fiat mist. st. coch. i. *mag. ter in die cum coch.* ii. *mag. mist. alkalin. dum effervescent.*

(*Alkaline Mixture for the above.*)

℞. *Potassii Bicarb.* ℥v.
Aquæ Chloroformi ad ℨxij. *Misce.*

Signa—"*Alkaline Mixture.*"

Iodide of Iron will be found invaluable in *struma* and *syphilis*, and in the form of the syrup is well suited to the taste of children.

(*For a child two years old.*)

℞. *Syrupi Ferri Iod.* ℥iij.
Olei Limonis gt. iv.
Syrupi ad ℨiv. *Misce.*

Fiat mist. capt. coch. i. *min. ter in die.*

Tinct. Ferri Perchlor. is, perhaps, the best and most used preparation of iron. It cannot be given with alkalies. If ordered with substances containing tannin, like digitalis and ergot, the mixture can be made bright by the addition of a little Acid. Phosph. Dil.

Glycerin is the best corrective to order with the liquid iron preparations, and makes a much more agreeable mixture than if spirit of chloroform be used, though the latter prevents the iron from causing any gastric irritation, and is sometimes retained when the stomach rejects more elegant combinations.

The *dialysed iron solution* is the least irritating and objectionable of all the iron preparations, and its hæmatinic qualities are unmistakeable. It may be also used as an antidote to arsenic. It is to be regretted that it is now no longer official.

The syrup of phosphate of iron is useful in the dyspepsia of anæmic patients. It should be ordered by itself.

The *Mistura Ferri Co.* has long maintained its supremacy amongst the iron preparations as a remedy for *absent or scanty menstrual discharge*. If its position is well deserved, it is certainly by producing the maximum of good with the minimum of iron, as it is often in a decomposed condition before being swallowed by the patient.

The *Saccharated Carbonate* is a very agreeable form for giving iron.

The *Sulphate* is a good tonic and astringent, and is a valuable addition to purgatives. It enters into Blaud's Pill, but the iron becomes changed into carbonate, and it is now one of the most frequently ordered of all remedies for *amenorrhœa*. In this form it does not cause constipation ; 9 pills may be given in the day.

Ferrum Redactum is a plain chalybeate without astringency.

℞. *Ferri Redacti gr.*vi.

Glycerin. Tragacanthæ q.s. ut fiat pil. Misce.

Mitte tales xxiv. *st.* i. *ter in die post cibos.*

Notwithstanding all that has been said in favour of the new organic salts of iron, they do not appear to possess any superiority over the older preparations.

Ficus—The fig is nutritious, and acts as a mild laxative. When taken in large quantities it causes griping, probably by the presence of the indigestible fruits, or so-called seeds, irritating the mucous membrane, and setting up irregular and painful contractions. Split open and heated, figs make a popular emollient poultice.

Filix Mas is used as a remedy for *tænia solium* and *bothriocephalus*. It should be given to an adult in 60 minim doses, early in the morning, after a previous castor oil purge administered at bed-time, to insure the complete emptiness of the bowels; or it may be given at night, after fasting, and be followed by a purge next morning. Care should be taken to look for the head of the worm, for until this is obtained there is doubt of its destruction. The fern seems to act as a direct poison to the parasite. It has also been given in *cholera*. It may be combined with turpentine, or given in capsules.

℞ *Ext. Filicis Liq.* ℥j.
Spt. Terebinth. *m.* xxxv.
Ovi Vitelli i. *Misce et adde*
Aquæ et Syrupi q.s. ad ℥ij.
Fiat haustus, mane sumendus.

Fœniculi Fructus—Fennel acts like Anethum (which see). In addition to its aromatic qualities, it is supposed to have the power of increasing the flow of milk. The water is a favourite antispasmodic for infantile colic, in tea-spoonful doses for a child 1 year old.

Galbanum resembles asafetida in its action, only it is feebler, and should have been omitted from the new B.P.

Galla—Since the value of galls depends upon the tannic and gallic acids contained in them, the reader is referred to Acid. Gallicum.

Gelatinum is only made official in order to obtain a basis for glycerin suppositories. Recently Carnot has demonstrated the value of gelatin as a powerful hæmostatic and styptic, first discovered by Dastre, 5 per cent. solution may be applied on lint to wounds and in epistaxis.

Gelsemium—Full doses produce brow-ache, giddiness, staggering gait, double vision, contraction of the pupil, ptosis, numbness of the fingers, and a peculiar expression of countenance, chiefly owing to loss of power of the ocular and facial muscles.

In poisonous doses the patient becomes unable to articulate or walk, a peculiar tremor of the head is noticed, sensibility is but slightly impaired, the pulse becomes quick and finally cannot be felt, the respiration is slow, the motor and sensory columns of the cord are depressed, and paralysis of all the muscles in the body follows, and the temperature falls. The writer found a patient

clinging to a lamp-post in the street with most of these symptoms well marked after two doses of 1½ gr. each of the old B.P. alcoholic extract. Convulsions precede death, which results from paralysis of the respiration.

Gelsemium has been found to possess power over *migraine* and *neuralgia*, and has relieved even when the cause was not removed, as in caries of the teeth and alveoli. The writer has seen great benefit from it in severe *tic*. It often appears to exert most power over neuralgia of the branches of the 5th nerve supplying the lower jaw. The administration should be stopped after ptosis and staggering have been noticed. 10 minims of the tincture may be given every 3 or 4 hours.

Bartholow used it in *pleuritis and pneumonia* (where it appears to relieve as aconite does), and in *asthma*, *laryngitis*, and *spasmodic coughs*, of various kinds; but to be really beneficial in these cases it must be given in doses approaching the dangerous. It has been given in the *hæmoptysis* of *phthisis*, and to cause dilatation of the rigid os, and applied locally to the eye to cause dilatation of the pupil, though the pupil is always found to contract after full doses given internally.

Gentianæ Radix is a simple bitter tonic. Its mode of acting on the system is the same as that of Calumba (which see). It has been supposed to exert some slight stimulating effect upon the liver. Few remedies will give such good results in the *vomiting of pregnancy* as the infusion, combined with a mineral acid; it will often stop retching when other remedies fail, and it is a feeble laxative.

℞ *Inf. Gentianæ Co.* ℥viiss.
Acid. Hydrochlor. Dil. ℥iv. *Misce.*

Fiat mist. cpt. coch. i. *mag. ter in die ex paululo aquæ.*

Glusidum—Though this drug has had very extensive trials in various diseases, it has at length found its place in medicine as a mere sweetening agent in conditions such as *diabetes*, *obesity*, *dyspepsia*, *cystitis*, *eczema*, &c., where sugar is contra-indicated. It has antiseptic powers but not in ordinary doses, and it passes out of the system by the urine unaltered. Soluble gluside is prepared by neutralising the pure substance with the bicarbonate of sodium and evaporating the solution.

Glycerinum is nutrient, and has been substituted for cod liver oil; but there is no proof that it possesses any of the valuable properties of that drug. Its administration is followed

(if persisted in for a time) by increase of body weight; in large doses it causes red colouration of the urine, from transudation of the colouring matter of the blood. It may be used to sweeten the unsavoury food of *diabetics;* and in large doses it is laxative.

Externally, it is emollient when applied to the skin, but occasionally, when undiluted it acts as an irritant. It has been recommended in every form of *skin disease requiring emollient treatment.* By keeping the part to which it is applied continually soft it cures *fissures* and prevents *excoriations;* with borax it forms the most satisfactory application to *chapped nipples* and *stomatitis*, and can be used in the *aphthous* state so common about the *genitals* of badly-cared-for female children. It prevents *bed sores.* Applied on cotton-wool to the *os uteri*, and kept in contact, it causes a copious watery discharge, diminishing rapidly any congestion which may be present. Plugs inserted into the nostrils in a similar way may benefit *hay fever.*

Applied to the mouth and throat it relieves the distressing dryness of these parts in prolonged *feverish* states, and it relieves *reflex cough* and irritability of the fauces. It may be given for *hæmorrhoids*, in tea-spoonful doses, to which a little chiretta is added to destroy its intense sweetness. The injection of a drachm of glycerin into the rectum by a suitable syringe is now much used as a means of moving the bowels in chronic constipation; it is at best a temporary expedient, and aggravates the malady in the long run. The suppositories are a very convenient method of causing an evacuation. If piles be present they may be greatly irritated. Glycerin is a powerful antiseptic, a ten per cent. solution in water preserving animal substances from decay. It is useful in *dyspepsia*, especially in the fermentative variety. Squire recommends a solution of 15 grs. isinglass in 1 oz. glycerin for various skin diseases.

Glycyrrhiza has demulcent properties and is used to relieve *cough* and promote *expectoration.* It is chiefly used for its pleasantly sweet taste. Fresh liquorice root is slightly laxative. The fluid extract covers the unpleasant taste of many nauseous drugs, and the compound powder is only of value on account of the senna it contains.

Gossypium is employed for its physical qualities—softness, elasticity, &c. It affords a protective covering for *burned* and *blistered* surfaces, and is used as a padding for splints, and in *rheumatic fever* as a covering for the inflamed joints. In *phlegmasia dolens*, applied in a *thick* layer over the entire limb, and most completely surrounded with Mackintosh, or oiled silk, and bandaged carefully so that the natural moisture cannot evaporate, the writer has found it to be the best of all treatments. *Gouty inflamed joints* are best treated in the same manner.

Granati Cortex is considered a valuable astringent in the *dysentery* and *diarrhœa* of hot temperatures. In large doses it kills the *tape worm*, and 2 ozs. decoction every two hours for four doses, followed by a brisk purge if necessary, will prove a good remedy for this troublesome parasite. Many authorities maintain that it is the best of all remedies. The drug itself acts in large doses as a cathartic. Best results are obtained by using the tannate of pelletierine, which see in the Non-Official section of this volume.

Guaiacum once held a high position as a remedy for *syphilis*. The only effect certainly known to follow its administration is that of a mild diaphoretic and emmenagogue. Sawyer gives 10 grs. of the resin before breakfast for *amenorrhœa*, and 1 dr. of the ammoniated tincture every 2 hours in *dysmenorrhœa*. It seems to have some power in relieving the wearying pains of *chronic rheumatism*, and it was an important constituent in the famous "Chelsea Pensioner"—an electuary consisting of the following—and found useful in the rheumatic and gouty complaints of *old people* :—

(Chelsea Pensioner.)

℞. *Guaiaci Resinæ* ℥j.
Sulphuris Sublimati ℥ij.
Pulveris Rhei ʒss.
Pulveris Sinapis ℥ij.
Potassii Nitratis ʒss.
Mellis vel Theriacæ q s. Misce.

Fiat electuarium, st. ℥i. *mane nocteque.*

The ammoniated tincture of guaiacum has been strongly recommended in *acute tonsillitis* in half-dr. doses in sherry. The mixture and powdered resin are better preparations.

Hæmatoxyli Lignum—Logwood is a valuable astringent and tonic, acting like tannin. The solid extract now omitted from the B.P. is one of the most valuable of astringents. No other drug is so efficacious in the *diarrhœa of tubercular ulceration* and the inveterate *diarrhœa of childhood.*

℞. *Ext. Krameriæ* ℥iss.
Tincturæ Opii ♏.lxxx.
Pulv. Cretæ Arom. ℥iss.
Decoct. Hæmatoxyli ad ℥iv. *Misce.*

Fiat mist. cpt. coch. ii. *min. post singulas dejectiones liquidas.*

Hamamelis has long been used by the Indians of North America as an astringent. In *epistaxis*, *hæmatemesis*, *hæmoptysis*, *hæmaturia*, *menorrhagia*, and especially in *hæmorrhage from piles*, it has checked bleeding. In what way it acts is by no means certain, as it is not very rich in the ordinary astringent principles —tannin, &c. It acts both locally and constitutionally, but it is chiefly for its local action that it is most used. 1 part of the tincture, with 10 of water makes a lotion for *wounds* and *ulcers*, or an injection for bleeding or ulcerated *piles*, which can be easily retained. It also is used in *gonorrhœa*, *leucorrhœa*, &c. In all cases it is well to administer it internally at the same time, in 5 minim doses of the liquid extract of the leaves, 3 or 4 times a day. Hamamelis is not toxic, and no very definite action upon the vascular system can be demonstrated by experiment. It seems to act upon the muscular fibres in the coats of the veins. It has been extolled as a remedy in *dysmenorrhœa*, relieving pain and langour and producing a comfortable feeling of exhilaration. Brunton found it in some cases of *hæmoptysis* to be more efficient than either ergot or digitalis. The writer has used it as a local application to varicoceles and varicose veins with apparent success in some cases, and as an enema (1 oz. hazeline, 2 ozs. water) in bleeding hæmorrhoids, or injected into the bladder in *hæmaturia* from villous growths.

Hemidesmus is supposed to act like sarsaparilla. It is a feeble stimulating diaphoretic, and is used as a remedy for *syphilis* in India. Possibly the fresh plant has some power, for the dried herb seems to have none, and its retention is a blot on the new B.P.

Hirudo — Leeches are used to extract blood in local inflammations, and healthy specimens may be calculated to remove two drachms each. They should be applied when possible over such prominences as will permit of a gentle pressure being applied in case of excessive hæmorrhage from their bites. In applying leeches they should never be touched by the fingers of the nurse or attendant. The physician should order the dispenser to send them in a perfectly clean chip box, which should only be opened as the affected part is exposed, and the inversion of the box (which should be steadily pressed against the skin till they fasten) is all that is generally necessary. The part should be very clean, and free from all traces of soap, mustard, &c., and if the leeches refuse to bite, which is seldom, a little sugar or cream, or, better still, the minute scratch of a needle, determines the point. They should not be pulled off after their feast, but should be allowed to drop ; if, however, it is necessary at any time to remove them, a little salt sprinkled

over their backs acts as a brisk emetic, and they drop off at once.

Should further bleeding from the bites be required, a hot poultice or fomentation may be applied, or a cupping-glass may be put over the bites ; this latter is an excellent plan. A pad of wool or gentle pressure with the fingers will easily restrain the hæmorrhage ; but occasionally perchloride of iron must be used, or even a hare-lip needle, with a figure of 8 thread, may be required. Matico leaf or puff-ball will, however, answer all purposes.

The extraction of blood by leeches should not be recommended in extensive inflammations, for if the system is to be affected it can only be by opening a large aperture and *rapidly* removing a fair quantity of blood in a short time. By the *absolute* rejection of venesection, therapeutics loses a valuable remedy. The writer has twice seen life apparently flow in as the blood ebbed out. It is in cases of *engorgement of the pulmonary vessels*, following severe chest injury, and threatening imminent suffocation, that by boldly striking into a large vein life will be saved. He has followed this course in a hopeless case of *submersion*, where death was apparently rapidly approaching. The systemic veins and pulmonary circulation were engorged, and the burdened right ventricle threatened momentarily to cease its almost ineffectual contractions. By making a *free* incision into the median basilic the inspirations became gradually slower, and the heart, eased by the relief of the systemic circulation, commenced to beat strongly, the patient appeared to be suddenly snatched from death, and made a speedy recovery. In such a case death would probably have occurred from suffocation, even had the patient's body been covered with leeches.

Recent investigations, with an extract made from leeches, show that it prevents the coagulability of the blood, and prevents its putrefaction. It has been suggested to inject it in clot or thrombosis, or to add it to blood before transfusion. The extract also so stimulates the leucocytes and adds to their voracity that it has been seriously suggested as a means of producing immunity to various microbic diseases.

Homatropine acts like atropine and produces mydriatic effects, weaker, but preferable to those obtained by that drug. Discs or a few drops of a (4 grs. to 1 oz.) solution dilate the pupil and paralyse accommodation, the paralysis disappearing in 24 and the dilatation in 48 hours ; whilst the effects of atropine generally last for several days. Cocaine can be combined with it. It has been used internally in cases where atropine is indicated.

Hydrargyrum was in its metallic state formerly employed in very large quantities to open the bowels in *constipation* and *obstruction* by mechanically driving the contents before it as it gravitated towards the anus.

Inhaled as a vapour, or used as a fumigation, the metallic mercury is active ; swallowed, rubbed into the skin, or injected hypodermically, or applied endermically, mercury and its salts produce marked constitutional effects. If only a minute quantity be administered, and for a short time, there will be an increase in the number of the red blood corpuscles, a general improvement in the circulating fluid, and an increase of body weight. If the minute doses be indulged in for a longer period, or if the quantity be increased, the blood loses in fibrin and red corpuscles, and becomes charged with excess of waste products ; a brassy taste is felt in the mouth ; the gums swell, and are marked with a blue line ; the teeth are tender ; the salivary secretion is increased ; and fetor of the breath is noticed. The spongy gums soon ulcerate ; the salivary glands enlarge ; and as the metal is eliminated, it stimulates all the glandular apparatus—cutaneous, salivary, intestinal, and renal —by which it is thrown out ; nervous tremors and disorders of co-ordination appear ; emaciation, prostration, and finally death will occur. These symptoms follow the prolonged administration of any mercurial preparation in small doses.

The *inhalation* of mercurial fumes, as seen amongst mirror makers and others, often produces symptoms confined to the nervous system. This form of chronic mercurialism is known as " Mercurial Palsy." There is tremor of the muscles of the extremities and head, not unlike *paralysis agitans*.

Calomel, mercurial chalk, or blue pill are the preparations administered when we wish to get the physiological effects of mercury ; the red iodide and corrosive sublimate are also used though they are violent irritants. The salts of mercury are dissolved in the stomach or intestines, and find their way into the blood as albuminates, and in their passage out exhibit their selective action, chiefly on the salivary glands, and it is supposed also on the pancreas. While in the blood, the drug probably acts by destroying the micro-organism which produces syphilis.

Exaggerated ideas of the dangerous results of mercury upon the system have arisen, probably because in disease the use of the drug had been generally pushed too far. We know now that it is entirely unnecessary to produce the above effects in order to treat a disease by mercury, and it is evident to those who closely watch the effects of mercury upon children that they will improve and grow fat upon it even for a long time, if judiciously administered.

Internally, mercury has been generally given (1) to control acute inflammation, or (2) to cause the absorption of inflammatory products, or (3) to combat the poison of syphilis.

There are, moreover, various groups of symptoms for the dispersion of which mercurials are used. The *diarrhœa* and obstinate *vomiting of children* often yield to minute doses—$\frac{1}{10}$ gr. of calomel every hour. A group of symptoms, known popularly as *biliousness* in the adult, is frequently dispersed by a good dose of calomel or blue pill, which, by removing all sources of irritation in the intestines, relieves an over-loaded liver, or remedies a catarrhal condition of the bile ducts ; calomel acts as a purgative—not by stimulating the liver to secrete more bile—but by irritating the duodenum, so that the bile is swept down the canal before time is allowed for its absorption There is thus really less bile circulating with the blood after a dose of calomel (which causes free purgation) than there was before. Few now advocate the use of mercury in *acute inflammations*, excepting in the case of *iritis*, and it is seldom employed to cause the absorption of effused products, though it is strongly maintained by a few that it controls *meningitis*, and assists the absorption of fluid effused within the cranium. In *meningeal inflammations* of a tubercular nature, after effusion has occurred, if the system be *rapidly* brought under the influence of mercury, such improvement follows as to lead one to believe that a partial absorption of fluid had resulted. In *simple meningitis* the writer has been fortunate enough to witness unmistakeable results.

Calomel acts in 5 to 8 gr. doses as a powerful diuretic in cardiac dropsy. Leech saw 10 pints of urine passed in one day after its administration. Serious symptoms have, however, been noticed even after 3 grs. three times daily for two days.

In *typhoid fever*, large doses early in the disease are used by Continental physicians to curtail its course. The red iodide in minute doses is vaunted as a specific in *scarlatina*, *diphtheria*, and the perchloride in *cholera*.

Mercury in Syphilis—Mercury is a true vital antidote to the syphilitic poison, and Hutchinson believes that many cases of indurated *chancre* treated early by mercury never show any of the characteristic symptoms of the secondary stage, and when these do appear they are milder than in cases where the mercury had not been used. (See the Author's "Dictionary of Treatment," page 874—884).

The administration of mercury is injurious in the soft spreading sore. In true indurated chancres, the mercurial should be commenced as soon as possible, and continued till thickening and induration melt away. Ptyalism and the other constitutional effects of the drug should never be produced, but

small doses of the non-irritant preparations—calomel, as in Plummer's pill, or grey powder—should be steadily administered, and their use suspended upon the appearance of changes in the gums, or any increase of saliva being observed. One grain of calomel, with quarter this quantity of opium, or 2 grains of blue pill, or $\frac{1}{10}$ grain of corrosive sublimate twice a day ; or 5 grs. Plummer's pill, or 1—2 grs. grey powder, three times daily, will be found enough. Milner contends that the green iodide is the best preparation, especially in light-haired and irregularly living patients.

Excellent results follow the method of *inunction*, even when the ordinary administration by the mouth has failed. The results obtained at Aix amply prove this, and the writer has satisfied himself that doses can be tolerated there which would produce disastrous effects at home. Patients at a place like Aix, going for a specific purpose, will regulate their life as they will not at home, and, moreover, there is the powerful influence of climate, which probably aids elimination of the metal. The German ointment (1 part of Hg. in 3) is decidedly superior to our stronger B.P. preparation. 38 grs. may be rubbed in twice daily. The inunction method in selected tertiary cases, as in testicular enlargements, is the best treatment where the iodide of potassium fails, as it often will, in effecting a permanent cure.

The method of *fumigation* by a spirit lamp and calomel is troublesome and uncertain.

The *hypodermic* method is much used on the Continent—$\frac{1}{3}$ gr. of the bichloride in $\frac{1}{2}$ dr. water. 30 injections in as many weeks into the gluteal muscles are said to effect a cure. 1 grain of yellow oxide, or of calomel, suspended in vaseline oil or weak mucilage, may be similarly employed. Grey Oil contains 40 per cent. mercury. It is made by mixing 39 parts of mercury, 2 of mercurial ointment, and 59 of vaseline oil : of this 1 to 2 grs. may be injected daily.

Mercury is seldom given by the *rectum* or *endermically* unless for its local effects.

Recently the *intravenous* injection of mercury has been carried out successfully by Lane and others. He injects 20 minims of a 1 per cent. cyanide of mercury solution into the most prominent vein below the elbow.

Mercurial treatment, as a rule, should be continued for at least one year, and at short intervals for another year, and it is a good general rule to prohibit marriage for three or four years. The administration should be discontinued for a time, or the dose materially lessened, on the appearance of the physiological effects of the drug.

In *congenital syphilis* there is no preparation equal to grey powder, which may be given freely, as mercury in moderate

doses seems incapable of doing harm whilst there is a large amount of the syphilitic poison for it to expend itself upon. Weak, emaciated infants bear larger doses when poisoned with syphilis than they can when afterwards apparently cured and fattened; but if, after a period of neglect, syphilitic symptoms come on markedly, then they bear very large doses again. A child half a year old may get ½ grain of grey powder three times a day for three days, then ½ grain every night, and this may be continued as long as the infant thrives. If no result seems to follow, a little of the ointment may be rubbed in occasionally.

The *corrosive sublimate* is the most poisonous of the mercurial compounds, causing violent purging, collapse, and death in a few hours when taken in large doses. It is the most powerful destroyer of germ life, and has been used with advantage internally and locally in a host of septic conditions. In *surgical* and *obstetric* practice, *diphtheria*, *gonorrhœa*, *tinea*, and numerous other ailments, its local application, with or without its internal administration as well, is beneficial. Considering the infinitesimal quantity of this substance necessary to form a solution which will *hinder* the growth of anthrax bacilli—viz., 1 in 1,000,000 (while 1 gr. in 5 gallons of water will *entirely prevent* the growth), it is easy to realise the enormous benefit which may be obtained from its disinfecting qualities without endangering the system by the action of the drug. The introduction of solutions of corrosive sublimate for washing out the vagina and uterus in lying-in hospitals has been followed by the lowering of the death-rate; but its indiscriminate use has already led to many serious cases of poisoning. 1 in 5,000 is quite strong enough for ordinary solutions. It may be prescribed with iodides advantageously.

℞. *Hydrarg. Perchloridi gr.* ij.
Potassii Iodidi ℥ij.
Aquæ Destillatæ ℥xij. *Misce.*

Fiat mistura, st. ℥ss. *ter in die post cibos.*

Externally, *Ungt. Hydrarg.* is used to produce the constitutional effects of mercury upon the system, by being rubbed into the skin. The following are a few of the uses of the different mercurial ointments which are applied for their local action :—

Ungt. Hyd. Subchlor. relieves the painful *itching* of various *eczematous* conditions about the genitals and anus; it is a valuable application to *all* indolent *syphilitic skin diseases*, and rarely causes salivation.

Ungt. Hyd. Ammon. acts as a poison to vermin, and readily destroys pediculi and their ova, and is used to kill the parasites which cause *tinea*, &c.

Ungt. Hyd. Co. and *Liniment. Hyd.* are used as substitutes for Scott's dressing. Spread upon lint, and applied with pressure around *diseased joints* and *glandular enlargements*, they are useful by stimulating the lymphatics.

Ungt. Hyd. Iod. Rub. is an active rubefacient, seldom used in this country except in veterinary practice, where it produces absorption of bony outgrowths and tumours. It is a powerful remedy for *goitre* in India, when aided by the rays of the sun.

Ungt. Hyd. Nitratis Dil. acts as a stimulant to the scaly stage of *eczema*, and in some way alters the action in the diseased skin, often after every other remedy fails. It is invaluable in inveterate *ozæna*, when diluted with glycerin and brushed inside the nose. The undiluted ointment has been successfully used to abort *whitlows* and *boils* by thickly spreading it over the inflamed part and covering with plaster.

Ungt. Hyd. Ox. Rub., diluted with eight times its weight of lard, or, preferably, *Ungt. Hyd. Ox. Flav.* is an invaluable stimulant and alterative in obstinate *conjunctivitis* and *eczema of the eyelids*, and is a substitute for the popular "Golden Ointment," but it must be most carefully triturated.

Ungt. Hyd. Oleat. is unstable and unsatisfactory.

Unguentum Metallorum is the name given to a mixture of equal parts of ointments of oxide of zinc, diluted nitrate of mercury, and acetate of lead, much used in *chronic eczema.*

Lotio Hyd. Nig. and *Flav.* are stimulating applications to various *chancroid* and other *sores* of a specific origin. Their efficacy tileads one to suppose that they act by destroying the syphili c poison as they come in contact with it.

Liq. Hyd. Nitratis is a powerful caustic, indicated in the treatment of *syphilitic warty growths* and *scrofula derma.*

A solution of the perchloride (5 grs. to 1 oz.) is used to destroy the *parasites of various skin diseases.*

Hydrastis contains 2 alkaloids—hydrastine and berberine, and the hydrastin of commerce is a mixture of these. The rhizome has been found to act as a tonic, and to control catarrhal conditions of the stomach, as in chronic alcoholism. It benefits the catarrhal conditions of all mucous membranes, as in *bronchitis*, *pharyngitis*, *otorrhœa*, *leucorrhœa*, *cystitis*, *gonorrhœa*, &c., a weak infusion of the drug acting still more potently when locally applied. It acts as a powerful agent in arresting hæmorrhages, especially *uterine* hæmorrhage, and many observers testify to its controlling *metrorrhagia* and *menorrhagia*, reducing *fibroids*, and in relieving *metritis.* It may be used wherever ergot is indicated ; it does not cause painful uterine contractions.

One part of the fluid extract in 40 of water may be used in *gonorrhœa* and *hæmorrhoids*, or for the naso-pharynx.

Hydrogenii Peroxidi Liq.—This solution for the first time finds a place in the B.P. It has been administered as a disinfectant and alterative, like iodine, in *glandular swellings*, on theoretical grounds, in *pertussis*, *scarlatina*, *diabetes*, *albuminuria*, and *fevers*, as an *antidote* to the alkaloids, and in *dyspnœa* and *rheumatism*, but with little results to encourage its use. Its local application to *purulent wounds*, *chancres*, and *sores* is attended with marked benefit. It is a powerful antiseptic and antiferment, destroying organised ferments with great avidity without having any effect upon diastase fermentations, and as a surgical dressing probably will win its way to a high place ultimately. Coming into contact with pus it causes effervescence by parting with its oxygen, which determines the death of the bacteria. Wile has obtained excellent results by injecting a 10 per cent. solution into the sac of abscesses after removing their contents. (See the Author's "Dictionary of Treatment," page 15.) Gibier, by adding a few drops of a 1½ per cent. solution to the hydrophobic virus, found that it failed to communicate rabies when injected into healthy rabbits. It possesses the power of bleaching the hair, and is used under various names as a cosmetic. A 1 in 8 solution has been proved to be of peculiar value as a disinfectant application to the middle ear to check chronic suppurative inflammations; and as a local application, for swabbing the throat in *diphtheria*, by Hatfield. It is the basis of the disinfectant known as Sanitas. A solution of the peroxide in ether is known as Ozonic Ether, and is used in *diabetes*, *scarlatina*, and *pertussis*, in drachm doses.

Dose—½ to 2 drs., largely diluted with water.

Hyoscyami Folia—This drug affects the system like belladonna, producing delirium, dryness of the mouth, dilatation of the pupil, and sleep. It differs from it in being more decidedly hypnotic and less stimulating to the heart, and in its sedative influence over the urinary mucous membrane. Small doses are sedative and tonic to the heart; large doses excite, whilst excessive doses depress it; hence it has been used in *cardiac asthma* and excitement of the heart from valvular lesions. In all the *spasmodic* affections in which belladonna is useful it may be employed. In inflamed and irritable conditions of the *bladder* it is valuable. The active principles of the drug are mildly *diuretic*, and in passing out of the system exert their sedative influence upon the terminal nerves of the irritated membrane; and it is especially indicated when the bladder is contracting frequently, to expel small quantities of urine unnecessarily. It may be advantageously combined with alkalies in these cases.

Children bear enormous doses of hyoscyamus, whilst the *aged* are seriously affected by even small quantities. It corrects the painful griping of purgatives, increases peristalsis, and relieves the pain of *internal neuralgic affections*. The juice in teaspoonful doses is the best preparation.

℞. *Tr. Hyoscyami* ℥iss.
Liquor. Potassæ ℥iv.
Ext. Pareiræ Liq. ℥ij.
Infus. Buchu ad ℥viij. *Misce.*

Fiat mist. st. coch. i. *mag. quater in die ex paul. decoct. hordei.*

Hyoscinæ Hydrobromidum—This is the soluble salt of an alkaloid obtained from hyoscyamus and various species of scopola ; it is also known as hydrobromide of scopolamine, and appears under this name in the German P.

It is isomeric with atropine, but differs widely from it in therapeutic action. It has a strong hypnotic effect, and in *mania* and other forms of *insanity* exerts a powerful sedative action upon the cortical centres. The reports of its value from asylums are in the main most satisfactory, though a few observers write unfavourably of the drug, possibly on account of variations in the purity of the specimens administered and the dosage employed. Krauss states that after its administration the maniac collapses as if struck by lightning, but that the calming down of the general paralytic is gradual, his restlessness soon settling into peaceful slumber. In *delirium tremens*, *puerperal mania*, and various forms of *insomnia*, it has proved most valuable. The writer believes that in insomnia, where there is a latent element of insanity, it is the best known hypnotic. Bruce finds that it acts well where the kidney is diseased.

Large doses, according to Wood, act upon the cord without depressing the motor nerves, and poisonous doses paralyse the respiratory centre.

Upon the heart it has little depressing action, though the pulse becomes much slower in marked contrast to the action of atropine, though slight delirium, dryness of the throat, and dilatation of the pupil follow.

Till more is known of its action it would seem wise not to use it in valvular disease with failing compensation. The writer has once seen most alarming delirium follow the injection of $\frac{1}{100}$ grain in ordinary insomnia.

Much confusion exists about the dose, and Binz is probably correct when he advises that the first hypodermic dose should not exceed $\frac{1}{600}$ grain.

The official dose, $\frac{1}{200}$—$\frac{1}{100}$ gr., may be given safely by the mouth, and $\frac{1}{200}$ gr. may be considered a fair hypodermic dose in patients not unduly sensitive to its action. Merck's preparation should be prescribed.

It has been used ($\frac{1}{300}$ gr.) in *paralysis agitans* by Erb, but the writer failed to observe any benefit from it in one case in doses of $\frac{1}{100}$ gr. by the mouth. It has proved successful in the *sweating of phthisis*, and as a pupil dilator in *iritis*. Emmert affirms that 1 in 1,000 solution possesses every advantage over atropine in eye diseases.

Hyoscyaminæ Sulphas is the soluble salt of another alkaloid obtained from hyoscyamus leaves. There are still many points to be settled about the action and dose of this substance.

The B.P. dose is $\frac{1}{200}$—$\frac{1}{100}$ grain. Many reporters who have used it mention doses as high as 1 grain, but it is certain that they employed the impure or commercial article, and their authority at present should be discounted as regards dosage. One grain or much less of the pure B.P. salt would probably be more than enough to cause certain death, and at present $\frac{1}{300}$ hypodermically, or $\frac{1}{100}$ by the mouth, should not be exceeded, and Merck's preparation should be prescribed.

It has been employed in *insomnia*, *mania*, *delirium tremens*, *paralysis agitans*, *asthma*, *neuralgia*, and *chorea*, but it would seem with less benefit than hyoscine. It seems to resemble atropine more closely in its action than hyoscine does. Ringer reports that he compared its effects in acute mania with atropine and could not observe any marked difference. It is a powerful mydriatic, and is used in ophthalmic practice, but possesses no advantage over atropine. The writer was informed by a most competent authority who lives upon the Atlantic that this is the only certain *preventive of sea-sickness* if taken for a few days in $\frac{1}{100}$ gr. doses before embarking. The writer has tried it with complete success in one case. The physiological action of the drug should be produced before the voyage is commenced.

Iodoformum, in long-continued doses, or where it has been slowly absorbed from wounded surfaces, produces disturbance of digestion, loss of appetite, malaise, vertigo, rapidity of pulse, insomnia, increase of temperature, and cerebral disturbance, not unlike some forms of alcoholic intoxication, passing into melancholia, collapse, and in a few instances death. These symptoms may come on suddenly without warning if the salt has been applied to a large surface; the temperature may rise to 104°, delirium, mania, and coma may set in, and speedy death

may ensue. Moorhof says that symptoms of poisoning never occur if the drug be used alone and no other antiseptics be employed with it. Bicarbonate of potash acts as an antidote in poisoning by iodoform. Experiments prove that *in the laboratory* germs will live in a 50 per cent. solution, but it is equally certain that *even weak solutions coming in contact with pus at the temperature of the body* become powerful germ destroyers. Binz has demonstrated that fat and ptomaines set its iodine free, and this substance produces the therapeutic and toxic action of the drug.

Iodoform is freely excreted by the pulmonary surface and kidneys, appearing as iodine in the urine, and though containing 96·7 per cent. of nascent iodine, it does not produce the irritant symptoms of even small doses of that drug. It is for its antiseptic properties that iodoform is used in surgery ; dusted in fine powder over *sloughing sores*, *chancres*, *buboes*, *bed sores*, and *cancers*, it prevents decomposition and excites healing. The stench of cancerous discharges from the vagina and rectum is instantly removed by the use of a pledget of lint soaked in 1 dr. iodoform to 1 oz. glycerin. A solution of 1 in 12 of ether, or of 1 in 12 of flexible collodion, may be painted over *syphilitic sores.*

Iodoform is a powerful local *anæsthetic*, destroying sensation in the parts to which it is applied as carbolic acid does ; the official suppository causes the sensation to be much blunted after its introduction into the rectum or vagina.

A bougie containing 10 per cent. of iodoform, with eucalyptus oil and cacao butter, has been used in *gonorrhœa.*

The B.P. ointment may be used for all ordinary sores, whilst 10 to 20 grs. to 1 oz. may be applied in *ophthalmia ;* 1 to 4 may be used for *granular lids.* Its anodyne and antiseptic properties render it a remedy of great value for *burns*, where the gauze soaked in glycerin and water and covered with cotton wool and oiled silk can be used with benefit.

Iodoform ointment is used by Grigorieff for *scabies.*

It has been recommended as an inhalation in *phthisis ;* but the internal administration in ½ to 3 gr. pills in the writer's hands has given better results. Flick recently reports glowingly of his success in *phthisis* by inunctions of iodoform, which almost always cured incipient cases. He now prefers europhen (1 in 20 of olive oil) rubbed into the groins and armpits nightly. It exerts its antiseptic and sedative properties upon the mucous membrane of the bronchi during its excretion by this tract. In a similar way it may be expected to prove useful in *cystitis* and *urethritis.* Intrapulmonary injections of iodoform, 1—2 grs. in ether, have been used with some success in *phthisis* and basilar cavity. Barling extols injections of about ½ oz. of a 10 per cent. glycerin emulsion into or around tubercular joints. Duplay and Cazin inject a mucilaginous emulsion into the joint cavity. It

is of no value as an anthelmintic, or in *diabetes*. It has been given in *ulcer of the stomach* for its local action as a hæmostatic. Tonquin bean, musk, coffee, Peruvian balsam, and turpentine cover its nauseous odour.

Iodum externally is a valuable counter-irritant, weak solutions causing mild rubefaction, whilst the liquor will sometimes vesicate. Weak solutions are absorbed when applied to the skin, and finding their way into the tissues stimulate the absorbent vessels, and thus aid the removal of *glandular swellings* and *local effusions*. The drug can always be found in the urine of patients so treated. Equal parts of the liquor (formerly called the liniment) and tincture is the best form for application. The liquor applied in its strength is found to cause changes of position in the corpuscular elements under the skin, but any effect produced by it is not owing to its absorption, but to its counter-irritant qualities. It has been found useful in chronic *glandular enlargements*, in various painful affections of the *thoracic* nerves and muscles, and painted in the neighbourhood of small *local inflammations* it often arrests the suppurative process and prevents the growth of *boils*. It is a powerful antiseptic, and the liquor will destroy parasitic skin diseases.

One part of the tincture in fifty of water is used to wash out *cysts* in which putrefactive changes are going on ; and diluted with an equal bulk of water, or alone, the tincture is injected into the serous cavity surrounding the testicle to excite adhesive inflammation and work a radical cure in *hydrocele*.

The vapour of iodine is used for inhalation in chronic suppurative *bronchial* affections. By incorporating iodine with the constituents of an ordinary candle a most valuable method of obtaining its virtues is obtained ; such "Iodine Candles," when burned, give out the vapour of the drug. The tincture (15 minims) injected into *solid bronchoceles* and enlarged *lymphatic* glands causes their absorption. Durante's method of treating surgical tuberculosis by injections of iodine has given splendid results.

Iodine is a powerful irritant poison, producing violent vomiting, purging, giddiness, convulsions, syncope, and death.

Internally, iodine in the free state is not often used, since iodide of potassium possesses nearly all the properties of the metalloid, without the disadvantage of causing gastric irritation. It is inferior to iodine in the treatment of *scrofula*, and iodine produces results in *malaria* where iodide of potassium is inert. Granville uses it in *gout*.

Since *Iodide of Potassium* is the form in which iodine is generally prescribed internally, its use will here be referred to. Given to a healthy man, iodide of potassium, in small doses improves the appetite and increases the weight of the body. It

is rapidly absorbed, and probably remains as iodide of sodium in the blood ; and if the dose be increased and taken frequently, a characteristic group of symptoms is developed, to which the name of *iodism* is given. A brassy taste is felt in the mouth, the amount of saliva is increased, and there soon appear signs of irritation of the mucous membranes of the eye, nose, throat, and bronchial passages, resembling an ordinary catarrh, with swelling of the eyelids ; the brows and teeth ache ; eruptions like acne, purpura, or urticaria appear ; appetite fails ; nausea and diarrhœa come on ; waste increases, causing emaciation, debility, and a sinking feeling at the bottom of the sternum ; sexual power is destroyed, and the urine becomes increased in amount, and tuberculosis may supervene. All the glandular organs of the body are stimulated to increased activity, and the drug has been said to cause wasting of the mamma and testicle. In some the symptoms of iodism cannot be produced, as patients have been known to take 1 to 2 drs. daily for several months or years. It is eliminated by the kidneys, salivary glands, bronchial membrane, and mammary glands ; and Binz believes that whilst being eliminated, and also whilst being carried to the different tissues of the body, *free* iodine is given off, which produces all the effects of the drug. In this way the irritation of the eye, nose, and bronchial membranes is produced, and the eruptions are probably produced by the elimination of the free iodine by the glands of the skin. He has demonstrated by a simple experiment that when *living* protoplasm is brought in contact with iodides in the presence of carbonic acid free iodine is always given off.

It should be remembered that some patients cannot take even the smallest dose of this drug without suffering from alarming iodism. The writer has many times witnessed the remarkable phenomenon pointed out by Brunton, that patients who took 1 or 2 grs. with great inconvenience ceased suddenly to have any trouble as soon as the dose was increased to 4, 6, or 8 grs.

It is invaluable in many *scrofulous* states, causing the absorption of various *effused unhealthy products*, either by increasing the activity of the absorbents or by rendering such products more fluid. In this latter way it acts upon the secretion of *chronic bronchitis*, and thus becomes one of our best expectorants. The products of *pleuritis*, *pneumonia*, and *pericarditis* often yield to moderate doses (5 grs.), and it is the best remedy for the early stages of *cirrhosis of the liver and lungs*. Schmidt has used it with success internally, along with the local application of cold to *goitres*. It is a strong anaphrodisiac and antigalactagogue, diminishing the secretion of milk satisfactorily in 10 gr. doses. Upon its elimination by the kidneys it acts as a powerful diuretic.

Full doses are said to cure *erythema* in the first few days, and it is given with success in *psoriasis* in very large doses.

In *chronic rheumatism, gonorrhœal rheumatism*, and *rheumatoid arthritis* it gives good results.

In large doses (20 grs. and upwards) iodide of potassium has been used for the treatment of *internal aneurisms* beyond the reach of surgery. It probably acts upon the coats of the diseased bloodvessel, and may effect alterations in the physical qualities of the blood; it also leads to fibrinous deposition and solidification. It may give marked relief to the wearying pains caused by aneurisymal growths without exercising any cure, and it gives good results in *angina.*

Germain Sée and Laborde maintain that it acts like digitalis as a true cardiac tonic, and the writer has obtained splendid results with it in *aortic valvular disease.*

It has been used with apparent success in the treatment of *enteric* fever on the Continent.

In *chronic metallic poisoning* the iodide of potassium, entering the blood, meets with the albuminates of mercury or lead stored in the tissues, and by forming soluble salts, which are eliminated, the system is purged of the poisons.

In a somewhat similar way iodide of potassium combines with the specific poison in *tertiary syphilis* and decomposes it. Its power over *nerve lesions*, the result of syphilitic deposit, is rapid and certain; *gummata* melt before its influence; and *bony enlargements* of a specific origin are often speedily reduced, but it must in such cases be pushed boldly in doses of 20 to 40 grs. Some physicians push the drug in such cases to the extent of 1 oz. in 24 hours, and Seguin states he has given 2 drs. thrice daily to patients between 4 and 8 years old without any bad results; this line of treatment he speaks of as the "American." The physician will seldom meet with cases where such doses are necessary. The effects of the drug in *syphilis*, though marked, are not lasting or curative, unless mercury be combined with it.

The same result is occasionally noticed as was mentioned about mercury in congenital syphilis—*i.e.*, after the apparent destruction of the specific poison, the system is less tolerant of the drug. It appears to possess little influence over the earlier stages of syphilis. Gowers insists upon the injury which long courses of the drug produce, but the writer has known large doses to be taken for many months without ever noticing any symptoms of injury.

The pains of *rheumatoid arthritis* are often benefited by the judicious administration of the iodide, and it speedily relieves *bronchial asthma* depending upon simple catarrh. It is perhaps

the best remedy in asthma when pushed. It acts occasionally as a powerful but uncertain diuretic.

The treatment of *hydrocephalus* by iodide of potassium has many advocates, and though it appears to have some control over the amount of fluid poured out, still evidence is not forthcoming to prove that it has any curative influence.

Half a grain, with 10 minims of hippo wine, is a valuable tonic given after food. Ammonia increases the effect of iodide of potassium; and when the dose exceeds a few grains it never should be given to a fasting patient.

On page 53 will be found the description of a method by which 6 grs. of the iodide can be ordered in a pill.

The following is still a favourite form with many :—

℞. *Liquoris Iodi Fortis* ℥j.

Liquoris Potassæ q.s.

Ad saturat. ferme, st. min. xx. *ex cyath. aquæ ter in die post cibos.*

Iodine is bleached by Carbolic Acid, and Percy Boulton recommends the following colourless antiseptic for general purposes :—Liquor iodi (B.P. 85) 2 drs., carbolic acid 50 grs., hot water 20 ozs. Dr. J. Wilson finds that 40 minims of the liniment (B.P. 85), 8 minims of carbolic acid, and 32 minims of liquor potassæ, make a colourless liquid (containing 1 of iodine in 18) which is neither caustic, vesicant, nor irritant. For colourless Tincture of Iodine see the B.P.C. formula at the end of this volume.

Ipecacuanha was formerly employed as a counter-irritant, owing to its power of producing a pustular eruption. The active principle (*emetine*) is a powerful poison. Large doses of the powdered root cause vomiting—*directly*, by acting upon the peripheral extremities of the pneumogastric in the stomach; and *indirectly*, by stimulating the vomiting centre; this effect is produced either by the hypodermic injection of the alkaloid, or by its internal administration. Its emetic action is too slow to be of use in poisoning, but it is highly beneficial in *croup* and *bronchitis* in children. In smaller doses (½ gr.) ipecacuanha acts as a direct stomachic, increasing the vascularity of the stomach, and promoting the flow of gastric juice, and, combined with the same quantity of iodide of potassium, we have one of the best remedies for *atonic dyspepsia*. Still smaller doses (1 min. of the wine), Ringer affirms, will cure the *vomiting* of

various conditions, as *pregnancy*, *alcoholism*, *migraine*, &c. In larger doses (3 to 5 grs.), the powder acts as a diaphoretic, but is uncertain unless when combined with opium—as in Dover's powder—and it is remarkable that the combination is so efficacious, only a grain of either remedy being in each dose, whilst much larger quantities of each, separately, are so uncertain. In diaphoretic doses it also acts very markedly upon the *bronchial* mucous membrane, causing free secretion of thin mucus, hence in disease it is one of the best expectorants we possess. The tough secretion of *chronic bronchitis* is thus rendered more fluid, and comes up with greater ease to the patient; whilst in acute attacks the dry inflamed membrane is soon covered over with a moist secretion.

Rossbach demonstrated the expectorant powers of emetine upon the exposed tracheal membrane, and his results prove it to be almost as valuable as apomorphine in *bronchial catarrhs* and *laryngitis*. It is especially indicated in inflammatory affections of the bronchial membrane in children, assisting the expulsive action and diminishing the adhesiveness of the secretion, its *diaphoretic* effect in these cases being also beneficial.

In *winter-cough* there is no remedy more efficacious than ipecacuanha, and a spray of equal parts of the wine and water has been successful in Ringer's hands.

The writer, in conjunction with Dr. Workman, made a series of experiments on the action of various remedies upon the cilia of the bronchial mucous membrane. Though a weak solution of ipecacuanha succeeded oftener and more effectually than any other remedy in restoring the movements after their cessation, the results were far from satisfactory or conclusive.

In speaking of ciliary excitants on page 325, the probability of medicinal substances assisting expectoration by their influence upon the cilia was referred to.

Ipecacuanha has been given in nauseating doses in various *hæmorrhages* with uncertain results. On the liver this remedy acts as a powerful stimulant, and it slightly increases the intestinal secretion.

In *dysentery*, in the acute stage, it possesses powers which are deemed almost specific; it should be given in doses of at least 20 to 60 grs., and the stomach seldom rejects it if absolute rest be enjoined and liquids sparingly swallowed. Merck has introduced a powdered ipecac., without any emetine in it, for dysentery. In *acute pneumonia* doses equally large have been given with good results. It has some influence over *whooping-cough;* as an emetic the wine may be given in tea-spoonful doses every 15 minutes to a child 1 year old, or 5 minims may be administered every hour in bronchitis.

(*Fothergill's Dinner Pill.*)

℞. *Pulv. Ipecacuanhæ gr.* j.
Acid. Arseniosi gr. $\frac{1}{20}$.
Pil. Aloes et Myrrhæ gr. iiss.
Pulv. Pip. Nig. gr. ij. *Misce.*

Fiat Pil. "The same dose of strychnine may be substituted for the arsenic." Above is an excellent fillip to the digestion.

Jaborandi and Pilocarpine act as powerful sialagogues and diaphoretics. After the hypodermic injection of $\frac{1}{8}$ gr. of the nitrate of the alkaloid marked results follow in a few minutes. There is flushing of the face and neck, beads of perspiration appear on the skin of these parts and rapidly extend over the body, and soon the entire cutaneous surface becomes bathed in profuse perspiration, which may pour in streams for more than an hour from the patient, saturating his garments or soaking the bed clothes. Saliva at the same time commences to flow, and it becomes also very profuse. Other secretions are augmented—the tears, bronchial and nasal mucus, gastric and intestinal juices, the cerumen from the ears, the urine, and, if a female, the milk, and uterine and vaginal mucus are increased. The blood vessels dilate as seen by the throbbing carotids, the pulse quickens and the patient seems warm ; soon, however, with the full establishment of the perspiration he feels cold and shivers, the pulse slows a little, while the blood pressure rises and finally falls. The pupils contract and the accommodation becomes tense; vomiting and painful forced micturition occur. As the effects pass off the pupils may dilate, and the patient feels sleepy and exhausted, and if put in the balance may sometimes be found to have lost as much as 7 lbs. in weight. The salivation and perspiration are the result of a stimulant action on the peripheral terminations of the nerves of the salivary and sweat glands, as well as some irritation of the *centres* which preside over these organs ; the other secreting organs are probably affected in the same duplex manner. The contraction of the pupil is caused by the irritation of the peripheries of the third nerve, and follows also its local application. The spleen, uterus, bladder, and intestinal muscular fibres contract, and in large doses the heart fails through paralysis of the endings of the vagus, which were at first stimulated, the ganglia escaping. The bile is not increased ; the drug is eliminated by the kidneys, but not by the skin. The respiration is scarcely affected. The writer has sometimes seen collapse and alarming prostration speedily follow the hypodermic injection of even $\frac{1}{4}$ grain.

Nearly all the effects of pilocarpine are antagonised by atropine, and it fails to produce salivation and sweating if this latter drug has been previously administered. Atropine should be promptly injected if alarming symptoms show themselves during the use of jaborandi or its alkaloid.

Pilocarpine has been applied locally to the eye in *glaucoma*, *intra-ocular hæmorrhage*, *iritis*, and *retinitis*, and good results appear to have followed its hypodermic administration in *detachment of the retina*. In *uræmic coma* and *convulsions* the hypodermic use of $\frac{1}{4}$ gr. will sometimes save life by the rapid elimination of urea and other products by the perspiration. In Bright's disease the hypodermic injection of the alkaloid, or 10 minims of the liquid extract by the stomach give good results by diminishing blood and albumen and increasing the amount of the urea. In the same way it diminishes *anasarca*, and by stimulating the kidneys assists in the removal of *pleural* and *peritoneal* accumulations. In *bronchial* affections it produces most marked effects, even blocking up the tubes by the profuse secretion which it creates, but it does not achieve anything which apomorphine and ipecac. will not perform without the serious drawback of its action upon the skin and saliva (see page 330). Nevertheless it has been used in *asthma*, *pertussis*, *bronchitis*, *tonsillitis*, *laryngitis* and *diphtheria;* in *diabetes*, *amenorrhœa*, *uterine* affections, *syphilis*, in poisoning by *atropine*, and in chronic poisoning by *iodine*, *arsenic*, *lead*, and *mercury;* and in skin diseases, as *prurigo* and *urticaria*. Under its use the hair has been noticed to grow rapidly, and it has been given to cure *baldness;* it may be applied externally to the scalp. Hypodermic injection will relieve ordinary *toothache*, and enlarged glands have been reduced by injecting the drug into their centres.

Small doses ($\frac{1}{25}$ gr.) are beneficial in the sweating of *phthisis*, and large doses ($\frac{1}{3}$ gr.) cause contraction of the *uterus*, and may induce labour. *Hydrophobia* and *myxœdema* have been treated in a few isolated cases by its use. Josham has found that $\frac{1}{3}$ gr. hypodermically has most remarkable sobering powers in *drunkenness*, and a similar daily dose has been given to increase the secretion of the mammary glands.

Jalapa is a powerful hydragogue cathartic, acting, like scammony, entirely by its *local* irritating effects upon the intestine, as injection of its active principle into the circulation has no effect upon the bowel. It must come in contact with the bile to be efficacious; the extract and resin produce considerable pain and griping; the compound powder will be found the most satisfactory form for giving the drug, and it is especially in *anasarca* and *ascites* that it is indicated. It may be given in 1 dr. doses, stirred up in a tumbler of water, or swallowed dry

in wafer-paper. The resin is less bulky and less nauseous than jalap, and may be given in 4 gr. doses, in pill.

Juniperi Oleum—A mild stimulant and stomachic in small doses. It rapidly enters the blood, and is picked out by the kidneys, which it powerfully stimulates, carrying with it increased quantities of water if *dropsy* exist, whilst in health it may even diminish the quantity of water. It excites the *genital organs*, and seems to resemble cantharides when given in very large doses, as strangury and priapism have been known to follow its use. The spirit makes a good addition to diuretic mixtures, and may be used as a substitute for gin when added to alcoholic liquors.

Kaolin is chiefly used as an excipient for pills containing permanganate of potassium, gold and silver salts, made into a mass with a little vaseline. Purified by elutriation and grinding it forms a valuable dusting powder for *intertrigo*, *weeping eczema*, *impetigo*, &c.

Kino is a powerful astringent, containing nearly $\frac{3}{4}$ of its weight of tannin ; it acts like it, and is useful in *diarrhœas*, *hæmorrhages*, *relaxed throat*, or when the effect of tannin is desirable. The compound powder is an excellent preparation, combining with the astringency of kino, the narcotic effects of opium. It resembles in its action both catechu and krameria.

Kousso. (See Cusso.)

Krameria—Rhatany is a valuable astringent and tonic, resembling kino and tannin in its action. 5 grs. of the extract and $\frac{1}{4}$ gr. morphine made into a suppository are valuable in *fissure* and *prolapse of the anus ;* and a tea-spoonful of the tincture in a wine-glassful of water makes a valuable wash for *spongy gums*, *relaxed throat*, or *mercurial stomatitis ;* or the following may be used :—

℞. *Tinct. Krameriæ*
Tinct. Myrrhæ
Tinct. Cinchonæ
Tinct. Kino ana ℥j. *Misce.*

Fiat mist. ℥j. *ex* ℥i. *aquæ utend. pro lot. oris mane nocteque.*

Laurocerasi Folia, though often used as a mere flavouring ingredient, contain hydrocyanic acid, and possess, when taken in sufficient doses, all the powerful sedative properties of that drug. (See Acid. Hydrocyanic.)

Lavandulæ Oleum acts as an antispasmodic like the following ; it is seldom used except as a perfume, and the

tincture is prized as a colouring ingredient, and enters into Fowler's solution, which undoubtedly would be better without it. Five minims of the oil on sugar will rapidly relieve *colic*, and it can be given in combination with cajuput.

Limonum—The oil and rind of the lemon are used in medicine only on account of their flavour, though in 3 to 5 minim doses the oil is a valuable remedy in painful and *irregular contractions of the intestinal tube* caused by accumulations of gas.

A decoction prepared by boiling fresh unpeeled lemons, sliced, is regarded as a valuable antiperiodic in *malaria*. The *fresh* juice has been found to promptly check *epistaxis* when injected into the nostril. (See under Acid. Citric., where the action of the Succus is described.)

Linum—Flaxseed contains a mucilaginous principle, which it yields to boiling water, and which acts as a soothing demulcent when it comes in contact with the gastro-intestinal mucous membrane, protecting it from irritating secretions. It has reputed expectorant qualities, which probably entirely depend upon its action on the throat as it passes through on its way to reach the stomach. Large doses of an infusion act as a diuretic by mildly stimulating the kidneys, and a patient with an *irritable bladder* often finds relief from it. Linum contusum in the form of poultice affords the best medium for the application of continuous moist warmth to *local inflammations*. When a hot linseed poultice is applied to a part, the warmth causes the small vessels to dilate freely; the muscular elements in the skin, hair follicles, and gland ducts are relaxed, and thus the tissues get soft, and the tight feeling or tension of inflammation is reduced or passes away; the sensitive nerve endings experience less pressure by the blood being drawn to the surface. A warm poultice to the *inflamed hip joint* sometimes relaxes spasm of the muscles and diminishes the transferred knee pain.

Poultices should be as warm as can be comfortably borne; a very hot poultice will often aggravate pain and tension by acting as a direct local stimulant.

The question often arises, when should poultices be applied to local inflammations, as in a case of *whitlow?* If applied early, general relaxation of the tissue is the result, and the tension which is fatal to the life of the part is removed, and resolution is more liable to occur; but if inflammation has already progressed so far that the white corpuscular elements have wandered through the coats of the vessels, or a purulent collection has already formed, poulticing assists it materially in reaching the surface. Thus poultices, by making the part an

internal one, are useful in *all stages of inflammation;* if applied early they prevent suppuration, and if used in the advanced stages they hasten or encourage it; and if an antiseptic quality existed in them, everything that is desired would be achieved. We have this desideratum in the spirit lotion when covered in with oiled silk.

The oil is laxative, but is seldom given except as an enema. Externally, it is a favourite application to burns, when made into an emulsion with lime water, constituting "Carron Oil."

Lithium—The carbonate and citrate of this element act like the corresponding salts of potassium, over which they possess the great advantage of being less caustic and of forming much *more soluble salts with uric acid.* The urate of sodium, which exists so largely in the system in *gout* is converted into the more soluble urate of lithium, which acts as a diuretic as it is eliminated by the kidneys. This result follows the use of either the carbonate or citrate, the latter being changed into the former in the system; and a solution of the carbonate (1½ dr. to 1 pint) has been found useful by Garrod for removing the *chalky deposits of gout.* The prolonged administration of lithium salts will dissolve uric acid calculi in this way, hence they are called lithontriptics.

Nikanoroff has demonstrated that these salts differ extremely from potassium salts in having no depressing effect on the heart, and they closely resemble sodium salts in depriving the red corpuscles of their hæmoglobin. When introduced into the stomach he found them eliminated by the urine within three days without increasing the amount of uric acid.

The effervescing citrate is an agreeable form for administering the drug. Up to 1 oz. of it may be taken daily.

Lobelia in large doses excites vomiting and purging, depresses, and finally paralyses the respiratory centre and peripheral endings of the vagus in the heart, and causes intense prostration and complete muscular relaxation, acting like tobacco, as a powerful narcotico-acrid poison, and causing death through its action upon the respiration. It is seldom employed except in *asthma* and *bronchitis.* It possesses two very decided actions—it is a powerful antispasmodic and expectorant.

These actions are not obtained unless the drug is pushed. 10 mins. of the new B.P. tincture may be given every hour for 3 or 4 doses, but it is better to follow Ringer's plan of small doses frequently—3 minims of the new B.P. tincture every 15 minutes as soon as the attack of asthma comes on till relief be obtained.

There is no reason why the antispasmodic effects of lobelia may not be intensified by narcotics, and the combination with

opium, morphine, or preferably chlorodyne, will give satisfactory results. It can be given with advantage in *catarrhal asthma* along with apomorphine, or with iodides in full doses.

Small doses sometimes relieve *spasm* of the *bowel* caused by fæcal accumulations. It has been used in *whooping-cough*. It increases the action of the skin and kidneys, acting as a diaphoretic and diuretic.

The alkaloid—lobeline—$\frac{1}{50}$ gr. is given in *asthma* and *angina*.

℞. *Tr. Lobeliæ Æther.* ℥iv.
Spt. Ammon. Aromat. ℥vi.
Tr. Chlorof. et Morphinæ Co. ℥ii.
Syrupi Pruni Virg. ad ℥iij. *Misce.*
Fiat mist. cpt. ℥i. *tertiis horis p.p.a. ex aqua.*

Lupulus—Hop is a stomachic, increasing the vascularity of the gastric membrane, aiding digestion and promoting appetite; by its slight narcotic effects it promotes sleep in various *irritable* or *delirious conditions*, either when taken by the mouth or made into a pillow, to rest the head upon. It is largely owing to the hop contained in them that malt liquors possess tonic properties. A bag filled with hops, dipped in very hot water, makes an agreeable fomentation in *colic* or *local inflammation*. Lupulin, in 5 gr. doses, is the best form for administration.

Magnesia and its carbonates act in the same way; entering the stomach, they are partly dissolved by the gastric juice and absorbed; the residue passing down the bowel is converted probably into bicarbonate of magnesium, and, acting like the sulphate, though much more mildly, it purges or acts as a laxative. Most of the oxide passes out unaltered in the fæces. The antacid properties of magnesia are serviceable in *acid dyspepsia* and *heartburn*, whilst tastelessness and freedom from acrid qualities and danger, in large doses, make it a favourite *purgative* for *children*. Gregory's powder is a valuable antacid laxative tonic. Magnesia can be given in 2 dr. doses in milk or lemonade. This latter increases its purgative qualities. The carbonate, by giving off carbonic acid in the stomach, has local sedative qualities not possessed by magnesia. 32 grs. of light calcined magnesia will absorb about 1 quart of CO_2, hence its great value in some forms of flatulence. The Liquor Mag. Carb. is an agreeable and mild purgative, less liable to lead to the formation of concretions of magnesia in the colon than the lighter powders. It affords the best treatment for acute and

chronic *urticaria* in the adult, and for the various forms of *nettle-rash* in infancy and childhood. It may be combined in these cases with tincture of rhubarb.

(*Dr. Gregory's Colic Mixture.*)

℞. *Magnesii Carbonatis* ℈i.
Tincturæ Card. Co. ℥ij.
Aquæ Anethi ℥ss.
Syrupi ℥ij. *Misce.*

Fiat mistura, sumat cochleare i. *min. frequenter in die.*

Magnesii Sulphas is the most certain and safe of saline purgatives. Professor Hay in his famous experiments upon the action of saline cathartics, which have thrown a flood of light upon this portion of the field of both Physiology and Pharmacology, has demonstrated the action of this salt. He found that it produced copious intestinal secretion according to the amount of the dose and the strength of the solution. The low diffusibility of the salt prevented the absorption of the secreted fluid, and thus between retarded absorption and stimulated secretion a large amount of serous fluid accumulated in the bowel until the quantity of liquid amounted to about what would be necessary to form a 5 or 6 per cent. solution of the salt. The peristaltic action of the bowel was but slightly increased, and this increase was owing to the distension caused by the large collection of secreted fluid. The sulphate was split up, and the acid, being more easily absorbed than the base, disappeared partially from the small intestine, to return, however, shortly afterwards. Meanwhile, the base (magnesia) was gradually undergoing absorption, but never pursued the same peculiar course of absorption and excretion as did the acid. In this way he explains the remarkable fact that one-fourth of a purgative dose, if injected into the veins, will cause death, but when swallowed the salt is split up in the canal, the toxic or basic part entering the blood so gradually that it has time to be excreted by the kidneys. These important results were obtained with phosphate and sulphate of sodium and sulphate of magnesium. It was that portion of the salt *which remained within the bowel* that caused the secretion of intestinal fluid, and not the portion absorbed into the blood. When the salt was injected into the blood directly, purgation did not follow, but rapid poisoning by profound depression of both heart and respiration soon supervened. The fluid accumulated in the intestine after the administration of sulphates of magnesium, and sodium at the expense of the

fluid part of the blood, which afterwards recouped itself from the fluid of the various tissues. The weaker the solution of the salt administered, the less fluid was extracted ; and if less than 5 per cent. solution were swallowed, no increase in the intestinal secretion from the blood occurred. If, however, a *very* concentrated solution were given, and the canal were quite empty, and no water were swallowed before or after a dose, a profuse pouring out of intestinal secretion, and subsequent concentration of the blood, soon followed ; thus after fasting, a large dose (say 1 to 2 ozs. sulphate of magnesium dissolved in its own weight of water) will cause almost as free depletion as if the lancet were used.

Prof. Hay obtained good results from the drug when used in this way in *dropsies* and in the removal of large *serous accumulations*. The rapid withdrawal of so much serous fluid from the blood is speedily followed by the extraction of large quantities of the transuded fluid from the areolar tissue or peritoneal cavity.

Wyatt-Smith states that the drug in the form of white mixture is a specific for *tropical dysentery* when given in full doses.

Many of the natural mineral waters contain sulphate of magnesium, most of them also contain sulphate of sodium, and are popular remedies for portal congestion and occasional constipation.

The carbonate may be well combined with the sulphate, and if administered in peppermint water, constituting the hospital Mist. Alb., makes a palatable and efficacious purgative, suitable in many diseased conditions. The Mag. Sulph. Efferves. is a very good preparation.

Sulphate of Magnesia has been administered hypodermically (2 grs.) by Fincke and others, who report that it causes purgation. J. Wood maintains that this result is owing to its paralysing the inhibitory power of the abdominal nerves, thus permitting a free flow from the intestinal glands.

Manganese Salts act somewhat after the manner of iron. They are used in *amenorrhœa*, *gastrodynia*, and *anæmia* by some. The black oxide is merely introduced into the B.P. Appendix for making chlorine. When injected into the circulation Kobert found that the paralysis of reflex action which resulted was produced by the destruction of the transverse conducting power of the cord. Death resulted from cardiac depression. For the action of Permanganate of Potassium see under Potassium.

Mel Depuratum is seldom used in medicine, except as a vehicle for more active remedies. In large doses it acts as a mild laxative. It has been praised for its expectorant qualities, which, if they exist, are probably owing to its local effect upon the throat and fauces. Externally, honey has been used as a

protective application to *bois* and *excoriations*. Its efficacy in *aphthous* states of the mouth entirely depends upon the borax with which it is associated. It has antiseptic properties like sugar. Oxymel is used as a *cough syrup*, and probably its action is purely local.

Menthæ Piperitæ Oleum and Menthæ Viridis Oleum are rapidly absorbed into the system, and behave as mild diffusible stimulants. Coming into contact with the gastric mucous membrane, they exercise at first a stimulating and afterwards a local sedative or *anæsthetic* effect, dispelling *nausea* and correcting *uneasiness*. They correct the irregular painful sensations caused by accumulations of *flatus*, giving speedy relief, probably through a reflex act by driving on the imprisoned gas. In a somewhat similar way the *griping* of *cathartics* is obviated. 3—5 minims of the oil may be given on a little powdered sugar, and repeated every hour. Externally, when applied undiluted, these oils produce *anæsthesia* and *relieve the pain of superficial neuralgias* and *herpes zoster*, and possess powerful antiseptic properties which have been useful in *diphtheria* and *phthisis*.

Menthol is a powerful antiseptic and local anæsthetic. When applied to the skin it destroys sensation, producing numbness without corrosive action, and thus it relieves when painted over the course of painful nerves, as in *neuralgia*, *sciatica*, and *pleurodynia*. It relieves *toothache* when applied to the carious cavity, and is a parasiticide when applied to various skin diseases. A 20 per cent. solution in olive oil has been applied with a syringe in *laryngeal* and *tracheal tubercle* with good results, its anæsthetic effects being cumulative, so that Rosenberg found, after a few injections, that the anæsthesia lasts 24 hours. It is also a good expectorant.

Mezerei Cortex is used now only as an irritant; when applied externally it causes inflammation of the skin and raises the cuticle like cantharides, though uncertain and slow in its action. It has diuretic properties, and was at one time supposed to act as an antidote to the poisons of *syphilis* and *rheumatism*, and to be useful in *inveterate skin diseases*. It should have been removed from the B.P.

Morphine. (See under Opium.)

Morrhuæ Oleum is the most easily-digested of all fats, and possesses very high nutritive qualities. Its great efficiency as a restorative agent in *wasting diseases* depends to some extent upon its power of aiding the assimilation of other foods, which would not be absorbed except in its presence. After meeting with the pancreatic juice and bile it readily emulsifies and enters the lacteal vessels, and it appears to have the power of bringing

along with it the oily and nitrogenous elements of the food. Digestion is thus considerably facilitated, the blood corpuscles are augmented, the weight of the body is increased, and a stimulus is given to healthy cell formation, which to some extent depends upon fat supply. It is a valuable expectorant, and Brunton believes, in *bronchitis*, that it acts by nourishing the newly-formed cells, which otherwise could not take on the character of mucous cells.

The great utility of cod-liver oil in *wasting diseases* is beyond dispute, and often its effects are decidedly curative in some forms of *chronic phthisis*, and in conditions like *scrofula*, *syphilis* and *rickets*, depending upon defective nutrition or errors of assimilation.

By directly supplying fat, which is an important element in the composition of the nervous system, cod-liver oil is beneficial in *nervous exhaustion* and *neuralgia*, and hastens repair in various structural and functional affections of the *nerve centres*.

The chemical constituents found in cod-liver oil have been constantly regarded as affording a satisfactory explanation of its effects in directly increasing the weight of the body and combating disease ; but the small amount of iodine is too insignificant to account for its action, and, moreover, iodine does not produce the beneficial results of the oil when given alone. The biliary matter contained in cod-liver oil undoubtedly assists the absorption of the oil and hastens its passage through animal membranes, but this is absent in the pale oil. The fatty acids present, especially in the dark oil, unquestionably aid in its emulsification and absorption, and so does cholesterin. (See under Morrhuol, &c.)

The writer found as a result of carefully weighing the subjects of disease under a course of cod-liver oil that they *increased considerably more than the weight of the oil taken by them.* The oil causes the absorption and assimilation of food elements not usually finding their way into the lacteals, and it nourishes the body independent of its own highly nutritious qualities. The many diseases for which this remedy appears to act as a specific depend upon some deep-seated error in assimilation, which is removed by the continued use of this valuable food and medicine. Hence the slowness of its action in cases of *chronic rheumatic arthritis*, *lupus*, *psoriasis*, &c.

Cod-liver oil should not be given in febrile conditions, nor in irritable nor catarrhal affections of the stomach and intestines. *Phthisis*, accompanied by high temperature, is not benefited by it, but a slight degree of fever should not prevent its administration if the digestive organs are healthy ; and if in such cases an effervescing mixture of the bicarbonate of potassium with lemon juice be given with a minute quantity of morphine for three or four days *the oil will be often relished afterwards.*

No advantages follow the mode of giving cod-liver oil in very large doses except that the surplus quantity generally acts as a mild purgative, but it often upsets the stomach and causes slight congestion of the liver. 3 doses will be found enough to begin with in all cases, afterwards 3iv. may be given *ter in die*, and it is a good rule to confine its administration to bed-hour for the first few days. It should always be given *soon after a meal.*

Various plans are suggested to cover its taste, but it is probable that the efficacy of the oil is diminished by the saponification and chemical changes which it undergoes in producing many of the so-called emulsions. The combination with extract of malt is a valuable one.

It can be emulsified by gum acacia or tragacanth, and flavoured with cinnamon, lemon, or bitter almond. This latter is the best, but, as a rule, it is advisable to begin with the oil in small doses, and leave the vehicle to the taste or caprice of the patient, who may try water, milk, coffee, wine, orange juice, beer, punch, &c., according to fancy. Some patients can swallow the oil without any trouble, but the unpleasant eructations afterwards cause intense discomfort. In these cases the addition of any flavouring ingredient is a mistake, and the only preventive (if the patient can tolerate it) is to hold the oil in the mouth for a time, and cause it to be thoroughly mixed with saliva by moving the tongue round the inside of the cheeks. Where this can be tried, the oil will be found to rapidly digest.

When no method can be found by which the oil is retained in the stomach, then recourse must be had to inunction; two to four drs. should be rubbed into the skin after a hot bath, and there can be no doubt that good often follows this practice. *The process of inunction is of the greatest use in the wasting diseases of children.* After about one table-spoonful is well rubbed into the skin of the abdomen, a deep flannel binder should be put on. This in a few days becomes saturated with the oil, and should be covered with as much thin mackintosh as will surround the body. The inunction should be repeated twice a day, and the flannel should be changed not oftener than once a fortnight.

The writer is satisfied that by the persistent and intelligent application of the oil in this manner surprising results may be obtained. Hypodermic injection of the oil is recommended.

Moschus is a diffusible stimulant and antispasmodic. It has enjoyed some reputation in low *febrile* and *typhoid states* with great nervous *excitement* followed by *prostration* and collapse. It acts as a stimulant to the respiratory centre. It has also been used in various disorders supposed to be of spasmodic origin. The dose (10 grs.) costs so much that the use of the drug is now practically confined to cases of such gravity that there is little

opportunity given to test its questionable properties. Barlow advises it in the *respiratory convulsions* of infancy, ⅓ gr. for a child one year old.

Myristica—Nutmeg is a well-known aromatic stomachic remedy, used for its agreeable flavour. In small doses (10 grs.) it acts as a stimulant to the stomach by increasing the flow of the gastric juice, aiding digestion and promoting the desire for food. In the same way it acts further down the canal by dispelling accumulations of gas and relieving *colic* and *spasm*. In large doses it is a *powerful and even dangerous narcotic*, acting upon the cerebrum and producing symptoms like those following poisonous doses of camphor—viz., vertigo, giddiness, and coma.

Myrrha possesses the power, in common with other gum resins, of stimulating mucous surfaces, and so influencing their relaxed condition in disease that the abundant secretion is checked ; thus *bronchial catarrh* and *chronic cystitis* are improved, and it appears likewise to relieve *leucorrhœa* and diminish excessive secretion from the *cervical mucous surface*. Its reputed emmenagogue properties rest upon very questionable foundation. Recently marvellous results have been reported from tincture of myrrh in diseases like *diphtheria*, especially where there is mixed infection. Stroll (Munich) treated 80 cases with only one death. He gives the following mixture every hour in ½ to 4 dr. doses—Tincture of myrrh 1, glycerin 2, water 47 parts. Binz has demonstrated that myrrh causes increase in the leucocytes, and the theory of its action is that it stimulates phagocytosis.

Locally, myrrh has a very beneficial tonic action upon *diseased mucous surfaces*, and may be applied to *spongy gums* and *aphthous conditions of the tongue* (see R. on page 410). *Foul ulcers* are likewise benefited by it.

Naphthol—Beta-naphthol in small quantities is fatal to low organisms of all kinds, and at the same time can be given safely to the human subject. Bouchard affirms that this substance is the best known intestinal disinfectant, and that it would require ½ lb. to kill an adult weighing 130 lbs., whilst 40 grs. will produce intestinal disinfection. Nevertheless its free use may cause fatal nephritis in the human subject, and Brunton states that when absorbed it causes vomiting, loss of consciousness, and hæmaturia. It has been used with success as a gastric disinfectant in cases of *pyloric obstruction ;* it may be combined with salicylate or other salt of bismuth. Those who have employed it as an intestinal disinfectant in *typhoid* fever speak very highly of it, and Bruce believes that it shortens the duration of the attack and lessens the risk of complications ; and many other authorities corroborate his conclusions. It may be given in 5—10 gr. doses, dissolved in oil, or in cachets.

Its action upon the skin resembles that of tar, and it is for this that it has been introduced into medicine. Kaposi uses it with great benefit in *eczema*, *psoriasis*, *scabies*, *chronic ulcers*, &c. His ointment consists of beta-naphthol 1 dr., lard 1 oz. It has been likewise used as a gargle in *diphtheria*, an injection in *leucorrhœa*, *gonorrhœa*, &c., in the strength of 2 to 5 per cent. Ointments for scabies and psoriasis should contain 15 per cent., and for *tinea* 20 to 30 per cent.

Microcidine is a new antiseptic and disinfectant, existing as a white powder, prepared by fusing together beta-naphthol and caustic soda. It is soluble in three times its weight of water, and has been used as a lotion to wounds and sores (2 grs. to 1 oz.). It is said to be free from toxic properties.

Nitroglycerin. (See Trinitrin).

Nux Vomica or Strychnine, in moderate doses, is found to act as a mild stimulant or exciter of the centres of those nerves going to supply the striped muscular tissue of the body. Experiment proves that its characteristic effects are not produced by its action upon the brain nor upon the muscles themselves, nor upon the nerve-trunks or endings, but only on that part of the cord where the motor *centres* are situated—*i.e.*, to the large ganglion cells of the grey matter of the anterior cornua. A large dose acts as a violent irritant to this part of the nervous system, and also to the vaso-motor and respiratory centres, causing convulsions of all the voluntary muscles, soon followed by spasm of the respiratory apparatus, and causing death by rigidity of the diaphragm and thoracic muscles.

After death the motor nerves are found to be impaired, owing to the exhaustion caused by the violent contractions preceding death, and only slightly through a direct action of the poison upon the nerves themselves.

The vaso-motor centre is stimulated, and the arterial pressure rises. This rise is exaggerated by the asphyxial condition induced by the convulsions, the blood being loaded with CO_2, which irritates the vaso-motor centre still more. The violent contractions of the muscles retard the circulation in the adjacent vessels, and the blood pressure is thus further increased. The cardiac ganglia are stimulated ; and the least stimulus, as a draft of air, produces powerful reflex spasms.

The symptoms closely resemble those of tetanus, but rigidity does not begin in the muscles of the jaw ; the convulsions are *tonic* in tetanus, and *clonic* in strychnine poisoning. The phenomena after the administration of strychnine come on rapidly, and soon pass off, or are fatal ; and there is no history of a wound or operation, as in tetanus.

Small doses after a time stimulate the *sensory nerve centres*, so that ordinary sensations are felt with unusual sharpness and keenness. The special senses and mental faculties thus are also quickened. In large or poisonous doses the mind is not further affected but remains clear to the last.

Owing to its stimulating action upon the reflex function of the cord, strychnine is useful in the treatment of many neurotic affections. In *paralysis* it is valuable, especially in those cases where the loss of muscular power is not great—*i.e.*, *paresis*. In *hemiplegia*, *paraplegia* of *reflex origin*, and in various forms of *local paralysis*, strychnine is the most serviceable remedy we possess; but it should not be given—(1) in recent cases; (2) whilst *rigidity* exists; or (3) in cerebral paralysis with continuance of head symptoms; (4) nor is it of much use where *great* wasting or fatty degeneration of the affected muscles is present; nor (5) where the muscles do not respond to the electric current.

Various spasmodic diseases are said to be cured by strychnine—*chorea*, *asthma*, and *epilepsy*, though the writer nearly always finds the symptoms are exaggerated by it.

Strychnine acts most beneficially upon the alimentary canal; being a pure bitter it increases the tone and vascularity of the stomach, improves appetite, and promotes digestion; and in *atonic dyspepsia* and various *chronic catarrhal affections* of the gastric mucous membrane it acts as an excellent tonic. Further down the canal its effects are even more marked; by its stimulating power over the reflex action of the cord, it greatly increases the muscular contractions of the intestinal tube, counteracting *constipation* and *fæcal accumulations*, and affording a valuable addition to purgatives. These effects are so marked that occasionally the stools are much altered in size, and may be seen to present the attenuated appearance observed in stricture of the rectum.

In the same way it proves useful in *prolapsus* of the *anus* and *atony* of the *bladder*, and has a strong aphrodisiac effect, and is useful in *sexual debility*. Functional *amaurosis* often very rapidly yields to strychnine in $\frac{1}{20}$ gr. doses. By stimulating the respiratory centre it relieves the *night sweats of phthisis*.

In *local paralysis*, the hypodermic injection of strychnine will be generally found to give splendid results. $\frac{1}{50}$—$\frac{1}{20}$ gr. injected into the muscular substance is soon followed by increased growth and power. As a rule, it is said to be useless where the muscles will not respond to the slowly interrupted current, but beneficial results will, undoubtedly, follow its use in many cases where electrical stimulation cannot be induced. Barwell injects $\frac{1}{30}$ to $\frac{1}{15}$ gr. in *infantile paralysis*, but it is not advisable to begin with more than two or three minims of the official liquor.

The writer believes that he has upon several occasions saved life in *diphtheritic paralysis* by free hypodermic doses, and in cases of *cardiac failure* as in acute *failing compensation* it is the only reliable drug when a rapid effect is necessary. It may be injected in *chloroform poisoning.*

Strychnine accumulates in the system by causing contraction of the renal vessels which prevents its own elimination, and its administration should be carefully watched. In a case of poisoning where death *almost* resulted, the writer found that the urine afforded not the *slightest trace* of strychnine, though the patient had been convulsed for 7 hours; the alkaloid appeared to have become oxidised or burnt up in the system.

It is advisable not to begin with a larger dose than $\frac{1}{30}$ gr., which may be gradually increased to the $\frac{1}{12}$ gr. 10 to 12 minims of the tincture of nux vomica, or $\frac{1}{2}$ gr. of the extract, will be enough for a fair dose. Death has resulted in man from $\frac{1}{2}$ gr. strychnine. It acts more powerfully from the rectum than if swallowed.

By its quickening or stimulating effect upon the sensory centres, the writer has found strychnine to be generally injurious in various *hysterical* and *nerve ailments* where there is undue irritability of the peripheral sensory fibres.

Strychnine is antagonistic to chloral and alcohol, and the writer believes that poisonous doses of alcohol afford the safest and best hope of success in strychnine poisoning. Since making this statement about the antagonistic effects of alcohol and strychnine in the first edition of this work, many observers have noticed that strychnine is antagonistic to alcohol, and strongly advise its use in *chronic alcoholism.*

The following forms will be found convenient for the administration of nux vomica and its alkaloid :—

(A good Tonic in Dyspepsia or Paralysis.)

℞. *Tinct. Nucis Vomicæ* ℥iii.
Acid. Nit-Hydrochlor. Dil. ℥vj.
Tinct. Aurantii ℥j.
Inf. Gentianæ Co. ad ℥x. *Misce.*

Fiat mist. cujus cpt. ℥ss. *mensura ex* ℥i. *aquæ ter in die ante cibos.*

(Pills for Constipation.)

℞. *Ext. Nucis Vomicæ gr.* ss.
Ferri Sulph. Exsic. gr. ij.
Ext. Aloes Barb. gr. iss.
Pulv. Ipecac. gr. ss. *Misce.*

Fiat pil. mitte tales xxiv., i. *omni vespere sumend.*

Olivæ Oleum, given in ounce doses, produces soft, painless motions, and by its soothing qualities it protects the bowel from contact with irritating secretions, foreign matter, or partially digested food. Thus it is highly beneficial in *constipation*, *inflamed* or *ulcerated hæmorrhoids*, and *fissure of the rectum* or *anus;* it is especially useful as a laxative in cases where the bowels have been locked up by opium. In small quantities it is a nutritious food. Its hypodermic administration has been advocated.

In 6 oz. doses, 12 hours after the administration of a blue pill, *gall stones* are said to have been passed in great quantity, and 20 to 40 ozs. have been administered by some physicians with good results.

Externally, its bland unirritating qualities have obtained a place for it in liniments, poultices, and ointments.

Opium and Morphine resemble each other so closely in their action that the description here given will apply to both.

A moderate dose of opium will act upon the alimentary tract from the mouth to the anus; dryness of the lips, tongue, throat, and gullet will be evident in a very short time, secretion being stopped or diminished; gastric juice ceases to flow, digestion is retarded, and the appetite fails. The intestinal fluids are not secreted as before, and constipation ensues after a time. Arterial tension slightly rises, the pupils contract, and the nervous system is influenced; first, there is a sense of pleasant activity of the cerebral faculties, ideas flow with speed through the mind, and exhilaration bordering upon mild intoxication may be noticed, soon followed by a calm of variable duration, which passes into drowsiness and sleep; often the stage of mental activity is absent, and it is always best marked in those accustomed to the use of the drug.

Headache, mental confusion, and malaise, with digestive disturbance, often remain after waking.

In fuller doses the above symptoms are present, only in greater intensity; the stage of stimulation is *shorter*, the somnolency comes on swiftly, and soon passes into sleep, with irregular slow breathing, and, if the dose be large enough, coma supervenes. In poisonous doses sleep comes on so rapidly that the excitement stage is not apparent. The pupils are strongly contracted, the breathing, at first slow and stertorous, becomes feeble and irregular, the face is cyanosed, and the skin cold and moist; the pulse, at first full and strong, becomes feeble and rapid; the coma, at first incomplete, and out of which the patient was easily aroused for a time, becomes more profound, until finally no stimulus appears to arouse the least response, and death occurs from asphyxia, caused by paralysis of the respiratory centre.

Opium checks every secretion in the body except that of the skin and mammary glands.

Only the higher cerebral centres are affected by full doses, but if repeated, gradually the basilar ganglia are influenced. The spinal cord does not escape, as may be often noticed by the retention of urine following large doses, and the sensory nerve fibres throughout the body are more or less under the spell of opium, for sensibility becomes diminished, apparently by the conductivity of the impressions being less perfect. Brunton found that opium influenced the peripheral terminations of the vaso-motor nerves, and thus diminished or prevented the reflex dilatation of the vessels, which always occurs when local irritation is present. This, he thinks, is the probable explanation of how opium cuts short inflammations.

These two distinct effects produced by opium—cerebral *excitement* in the first instance, and *sleep* afterwards—vary very much in different individuals, and also to some extent depend upon the way in which the drug is administered. Thus, in nervous excitable women, the first effect may be the only one noticeable, sleep not following; while, again, a very large dose will likely produce only the second effect, no excitement, or only a momentary flash being observed, sleep quickly supervening. By graduating the dose, the opium-eater can avoid the second stage, and prolong the excitement indefinitely.

Sleep results from the power of the drug to diminish or depress the functional activity of the cerebral cells, and at the same time to produce a state of anæmia of the brain, in which both arteries and veins are less full. The extreme contraction of the pupil, characteristic of opium poisoning, is clearly *centric*.

The effects of opium poisoning upon the pulse are explained by the action of the drug upon the inhibitory cardiac centre at first causing the slow full beat; the intracardiac ganglia also are at first stimulated, and afterwards greatly depressed.

Nothnagel believes that he has demonstrated that constipation results from the drug *stimulating the inhibitory nerves of the intestines* through the splanchnics.

Very large doses injected into the jugular purge rapidly by tetanising the intestine. Full doses paralyse the bowel. The stomach excretes the drug from the blood after absorption, and morphine is found in the stomach within a short time after a hypodermic dose—a fact to be remembered in the treatment of opium poisoning.

These hypnotic and anodyne qualities of opium render it the most important of drugs, and its application in disease is so extensive that only a brief reference to its numerous therapeutic uses can be made.

To produce *sleep* in all conditions requiring it, in the restless *delirium* of fevers and in *nervous prostration* from whatever cause, opium is one of the best hypnotics ; its good effects are seen in *delirium tremens* and in *acute* and *chronic mania* and *melancholia*. It is contra-indicated when the brain is congested and the eyes suffused and pupils small.

As an analgesic or pain reliever opium or morphine surpasses all others in certainty of action and safety. It relieves the pain of *sciatica*, *neuralgia*, *lumbago*, *gastralgia*, and *cancer*, and soon removes the agony caused by the passage of *renal* or *hepatic calculi*. In these cases the hypodermic injection of morphine is by far the best form in which to administer the drug, and it is a mistake to regard its effects as merely palliative, for *sciatica* is sometimes *cured* by a single insertion of the needle, a result which is not met with when morphine is given by the mouth. The physician must guard against the patient getting into the habit of using the syringe too often, as there is great danger of the opium habit becoming established ; and though space prevents any description of the evils arising from opium eating, a word may be said about its treatment. The writer's plan is to stop the administration of the drug completely, and to administer large doses of alcohol instead for 2, 3, or 4 days till the depression and craving are quite blunted, then the alcohol is gradually withdrawn.

Though this plan is open to the risk of establishing a more terrible disease than that which it is intended to cure, still it appears worth trying, but should only be used in cases where a considerable remnant of will remains. The writer succeeded with it completely in one hopeless case.

Cough is relieved by opium, but discrimination should be exercised in the exhibition of the drug for this purpose. In cases of *exhausting bronchitis*, with *profuse expectoration*, where there is only enough cough to empty the tubes, this remedy is a dangerous one ; but where a harrassing, frequent cough wears down the patient's strength, without much secretion, then opium is a blessing. It acts in these cases by diminishing the excitability of the respiratory centre.

In *acute inflammation* opium gives the best chance of cutting short the disease and guiding it to a safe termination. If given at the very onset of formidable affections like *acute peritonitis*, opium may be safely taken to a surprising extent ; and the amount of pain present affords the safest measure for the dose. Drachm doses of the tincture may be in such cases administered, and to guard against the risk of its lying in the stomach and being suddenly absorbed after an interval, it is wise to give it in several ways alternately—endermically ; by the mouth or rectum ; or hypodermically. It has long been a recognised fact that

opium given with no sparing hand will often save life in *severe inflammations*, especially of *serous membranes*.

The peristaltic action of the bowel is diminished, and thus it is doubly useful in *inflammation* of the *peritoneum* and in *intestinal hæmorrhage;* and from its tranquilising effect upon the circulation it is our sheet anchor in *hæmoptysis* and other *hæmorrhages*.

Small doses ($\frac{1}{10}$ gr. opium) have been found successful in the treatment of *irritative dyspepsia* by Graves, and all *enteric affections*, with excessive secretion, after the irritating cause has been removed by purgatives, are benefited by opium—thus, *dysentery*, *enteritis*, *cholera*, &c., are so relieved.

After *abdominal surgical operations*, a morphine suppository is followed by great benefit, and opium has been found useful in averting the rigor liable to follow *urethral irritation*. The presence of severe pain is always an indication for a large dose of this drug; women are more susceptible than men; children bear opium badly, and the physician will be wise who makes the rule, in the first few years of his practice, never to give opium in any form to a child under a year old. Gout and renal disease have been said to be barriers to the use of opium; but recent experience shows that the hypodermic injection of morphine may be beneficial in *uræmic convulsions*.

Idiosyncrasy influences the dose of the drug, some bearing very small doses badly; and the after evil consequences—headache, nausea, intolerable itching, &c.—vary much in different subjects. Those accustomed to its use can take enormous doses of the drug.

The 18 alkaloids found in opium produce different effects when administered separately; thus—

Morphine, Narceine, and Papaverine are highly hypnotic; while Thebaine, Narcotine, and Codeine are exciting, acting as convulsants; but it is generally only with morphine that the physician has to deal. It differs from opium in being (1) less astringent and constipating; (2) less powerful as a diaphoretic; (3) it possesses less power over acute inflammations, especially in the abdomen; (4) it is less likely to cause excitement, headache, and nausea; (5) it is more decidedly hypnotic and anodyne, and more liable to cause itching and retention of urine.

Morphine and atropine are antagonistic to each other, and the dangerous symptoms often following the hypodermic injection of morphine are certainly less likely to occur if $\frac{1}{100}$ gr. of atropine be added to each dose, and the combination is more effective. Not more than $\frac{1}{6}$ to $\frac{1}{4}$ gr. of morphine should be given for the first time by the hypodermic method.

Of the various official preparations, none equal in certainty and uniformity a pill made out of the crude opium; powdered opium is about $\frac{1}{8}$ stronger. They may be given in 1 to 2 gr.

doses; and next to them in constancy comes the tincture, which generally produces sleep in ½ dr. doses. The favourite Dover's powder expends itself chiefly upon the skin, which it stimulates more than a much larger dose of either of its constituents would do if given singly. 1 gr. of morphine is equal in therapeutic power to about 6 grs. opium.

☞ For Poisoning by opium see Poison Index.

℞. *Liq. Morph. Hydrochlor.* ℥ss.
Aq. Laurocerasi ℥xv.
Pot. Bromidi gr. xxx.
Aquæ Chlorof. ad ℥i. *Misce.*

Fiat haustus, hora somni sumendus.

Ovi Albumen—The liquid white of the egg—consists of about 14 parts coagulable albumen, 3 of mucus, and 83 of water, with traces of salts, and it is highly nutritious, supplying to the blood an element which is found in most tissues. It is introduced as a test for metaphosphoric acid in Acid. Phosph. Conc., and it is used to coat pills and clarify liquids.

It is used as an antidote in poisoning by salts of mercury and copper, as it forms insoluble compounds with these.

Ovi Vitellus—Egg-yolk is highly nutritious, consisting of nearly 30 per cent. of oil and crystallisable fat and 18 per cent. of albumen and some phosphorus. It is used in making emulsions, and enters into Mist. Spt. Vini Gallici.

Oxymel and Oxymel Scillæ. (See under Mel and Scilla).

Pancreatis Liquor is a solution of the digestive principles of the pancreas. This may be regarded as the official representative of Benger's Liquor Pancreaticus. The pancreas produces at least four ferments, the most important being Trypsin, which changes proteids into peptones in an alkaline or neutral medium; another ferment coagulates milk casein; another emulsifies fats, and another changes starch into sugar. This liquor contains at least three of these. The place of pancreatic ferments in medicine is chiefly that of predigesting foods before being swallowed. If the liquor be administered it is mostly destroyed by the acid gastric juice, but notwithstanding this, stomach digestion may be assisted by administering the ferments with the food at the beginning of a meal before the gastric secretion has reached its full acid strength; in this way the ferments will aid the saliva in changing starch, and proteids will be also attacked.

Trypsin, pancreatin, desiccated pancreas, and various dry

extracts are now procurable which can be administered in *dyspepsia* in the pilular form coated with keratine, so as to supplement the natural pancreatic function in the duodenum. They have also been applied with the view of breaking up the false membrane in *diphtheria*, and for stimulating the growth in *ulcers*, &c., or they may be used like the liquor for mixing with nutrient enemata before being injected or for injecting into the bladder to disentegrate blood clots. If pepsin be added to liquid foods the products formed as digestion proceeds are unpalatable and nauseating, and the compound cannot be swallowed or retained ; but if pancreatic liquid be employed, and the digestion stopped after about 15 to 20 minutes, an almost tasteless product can be obtained. This is easily accomplished by boiling as the pancreatic digestives are destroyed by a heat above 140°F.

To make peptonised milk, the liquid is diluted with about one-third of its bulk of water, and heated to 120°F., and 2 drs. of the liquor and 30 grs. bicarbonate of soda added, and the mixture allowed to remain for 15 minutes in a warm place. After this it may be swallowed, or if not to be used immediately it should be brought to the boiling point or placed in ice to stop all further fermentation, else it becomes bitter and curdles. Gruel, soups, or other liquid foods can be treated in the same way.

Fairchild's powder contains a dry extract mixed with soda, and it is more convenient than the official liquor.

The liquor has been administered in *diabetes* where the disease has been suspected to be of pancreatic origin, but 5 gr. pills of pancreatin, coated with keratine, are preferable.

Dyspepsia, gastric dilatation, ulcer, cancer and tubercular peritonitis, and many other conditions are greatly improved by pancreatic feeding, but the best results are seen in the feeding of infants deprived of their natural nourishment. Benger's food consists of wheaten flour partially dextrinised by dry heat and mixed with pancreatic extract ; during the cooking of the powder with diluted cow's milk pancreatic digestion takes place.

Papaveris Capsulæ resemble opium in their action, though much more feeble. The old B.P. extract, when carefully prepared, was a good hypnotic, not so liable to cause headache and nausea as opium. A decoction of poppies has long enjoyed a reputation as an anodyne when applied to various local inflammations ; its good effects are partly owing to the moist heat of the application.

Paraffinum Durum—Hard paraffin is introduced into the B.P. to make a firm, bland, and unirritating basis for various ointments. Its high melting point, hardness, and unchangeableness confer special obvious advantages upon ointments containing it.

Paraffinum Molle or Vaseline, or Petrolatum, is not affected by the majority of substances, and exhibits little tendency to become rancid. The absence of irritating or changeable constituents in it, and its absolute freedom from smell and grittiness, render it a good basis for ointments.

It is insoluble in water, and mixes with oils in all proportions, and it dissolves most alkaloids. It is, however, not a good basis if we wish to get these substances *absorbed*.

Its low melting point is a disadvantage, as when applied to the skin it melts and becomes quite liquid, and soaks into the dressings or garments, often leaving the incorporated substance almost dry and in direct contact with the skin; the addition of hard paraffin obviates this, and a better basis is obtained by a mixture of the two. Lanolin, lard, or any bland animal oil should be used when we wish to secure the absorption of the active ingredient by the skin. Thus ointments of the alkaloids are now made with lard, whilst the antiseptic remedies, as carbolic, boracic, and salicyclic acids, eucalyptus, &c., are now compounded with vaseline.

Alone, it forms an excellent and bland application to *eczema*, *intertrigo*, *burns*, *sores*, and *scalds*.

Paraffinum Liquidum—This tasteless, odourless liquid, now introduced into the B.P., is a solvent for various substances. It has been given internally as a demulcent, and has been applied as an emollient in various *skin diseases*, and as a basis for several hypodermic injections.

Paraldehydum is an hypnotic, and resembles chloral in its action, only it has no depressing effect upon the heart; it affects the cerebral cells, and, in poisonous doses, the respiratory centre. It acts as a diuretic, increasing notably the amount of urine, but has no diaphoretic action. It has been given in *mania*, *melancholia*, *sleeplessness* from various causes, always with success, and does not cause digestive or cerebral disturbances afterwards. Its only drawback is its rather unpleasant, chloroform-like odour, which affects the breath for many hours, and its sharp, disagreeable taste. It may be given in peppermint water and syrup or in almond mixture. The sleep which it produces is calm and refreshing, like natural slumber. It produces no excitement, and is more speedy in its action than chloral. It is especially valuable as a safe hypnotic in the *insomnia* of *cardiac diseases* and *mania*.

℞. *Paraldehydi* ℥iss.
Tinct. Aurantii ℥ij.
Aquæ Menthæ Pip. ʒiss. *Misce.*
Fiat haustus, hora somni sumendus.

Pareiræ Radix is eliminated by the kidneys, which it stimulates, thus acting as a diuretic; and, as the active principle passes over the mucous membrane of the genito-urinary tract, it exercises a soothing and tonic influence on the bladder; most valuable in *hæmorrhage* and *cystitis*. In the same way *suppurative kidney affections* are relieved, and sometimes unhealthy conditions of the *urethra*, causing *gleet* and smarting pain after micturition, are relieved by pareira. Its active principle undergoes change in the blood, for when injected for *gonorrhœa* and *cystitis* it does not appear to have any local beneficial action, though it appears to act like an ordinary tonic when admitted to the stomach.

The liquid extract may be given in ʒii. doses with liquor potassæ and buchu or hyoscyamus.

Pepsin (the chief principle found in the gastric juice) is a ferment or enzyme, possessing the power in presence of warmth, acidity, and moisture of converting proteids into peptones. Pepsin will work this change outside the body, and there can be no doubt that a similar action takes place in the stomach when pepsin is administered. The deficiency of gastric juice is known in many cases of *atonic dyspepsia* and *chronic gastric catarrh* to be the direct cause of the indigestion, and hence the value of pepsin. In *irritative dyspepsia*, with excessive secretion of acrid gastric fluid, pepsin does harm unless given in one very large dose (20 grs.)

Pepsin is a *ferment*, and large doses are not generally necessary, since its activity depends more upon the *state* of the stomach's contents than upon the *amount* of the ferment administered. It acts as a direct stimulant to the gastric mucous membrane, which it causes to pour out more secretion; in the class of cases most requiring pepsin *an acid is also necessary*. It is recommended in the *diarrhœa of children*, depending upon the presence of quantities of partially digested food passing along the intestines. It is useful in some forms of *vomiting* and *nausea*, probably caused by imperfect digestion, but there is said to be danger in giving pepsin in cases of gastric ulcer, as it might reach the liver unaltered.

If added to *nutrient enemata* it greatly increases their chances of being absorbed. Pepsin cannot be used to peptonise food intended for swallowing, as the taste of the product is most unpalatable. It has been applied to the false membrane in *diphtheria* with the view of causing its digestion.

Phenacetin possesses decided and valuable antipyretic and analgesic powers. It reduces fever heat with safety and certainty, in doses of 5 to 10 grains, which may be given every eight hours. It has been used in all the conditions in which antipyrine and antifebrin are indicated. It has been found not to possess toxic

properties to any appreciable extent. D-Beaumetz gave it as an analgesic in daily quantities of from 15 to 30 grs. for months in every variety of pain always with success, and without harm resulting. *Migraine*, *neuralgia*, *acute rheumatism*, and *ataxy* pains all speedily yield to it. Every form of fever and high temperature also are favourably influenced by it. It is best given in the form of powder, swallowed with water. The fall in the temperature lasts four or more hours, and there is generally some sweating, but no rash or cyanosis. It is best given in the evening, and 2 to 4 grs. may be given to children.

Phenazonum—All that has been said of acetanilide upon page 301 applies to the action of antipyrine, save that this latter drug is taken in double the amount of dose and is safer, and not likely to produce cyanosis, &c. Thus, the chief action of the drug is upon the temperature. This is very slight in health, but marked in fever. It may be taken as established that this reduction of temperature is the result of *diminished production* of heat, and this is effected by its action upon the heat centre situated in the corpus striatum. Metabolism is markedly checked and the urea diminished. Sweating occurs, but it in no way explains the fall in the temperature. The reflex excitability of the cord is much depressed, and, ultimately, anæsthesia results; poisonous doses paralyse the frog's heart, the colour of the blood is altered, and the pressure falls. The drug is eliminated in the urine. Antipyrine has been given in nearly every disease with high temperature and in almost every conceivable feverish condition—*typhus*, *typhoid*, *scarlatina*, *rheumatism*, *erysipelas*, and *pneumonia*. But the routine treatment of these diseases by this agent has certainly fallen into disfavour, as no appreciable gain results in the long run, and the drug is not to be relied upon in *hyperpyrexia*. There is, perhaps, no condition in which its antipyretic virtues are more apparent than in *phthisis* with high temperature. 10 grs. at first, and 5 grs. in one hour, and 5 grs. in one hour again, will be found a full and satisfactory dose. The temperature may be found to drop as many as 10° F., with relief of all the symptoms and distress for the time. Formerly these doses were doubled, and the drop often lasted 20 hours. Small and frequently repeated doses, though safer, are not satisfactory. It may be given hypodermically or by rectum. Though this treatment cannot be said to be curative, in selected cases its benefits are most marked. Often the temperature falls without sweating; there is often some cyanosis and even collapse followed by a rash. It is calculated that ten times the above dose would be required to make a decided impression on the body heat in health. In the febrile diseases of childhood (1 grain per year) it may be given hourly for 3 doses.

In addition to its antipyretic action it is a powerful hæmostatic

when administered internally or applied locally, and the writer believes that a strong solution should act well in *post-partum* hæmorrhage ; it controls *epistaxis*. Antipyrine is one of the most certain of analgesics, and there is hardly any pain which is not relieved by it. Its effect in *migraine* has been, in the writer's hands, most satisfactory. In nearly every form of headache and neuralgia, swallowed in doses of 10—15 grs. and repeated often, it generally gives speedy relief. The lightning pains of *ataxy* and the *gastric crisis* are cut short by it. Aneurismal and anginal agony also yield to it. After the relief of pain sleep often follows. The pains of labour are rendered bearable, and if ergot be administered it is said almost painless labour may result ; *dysmenorrhœa* may be relieved. The drug has also been given with success in *diabetes*, *sea-sickness*, *epilepsy*, *nocturnal emissions*, *asthma*, *hæmoptysis*, and *laryngismus*. Hypodermically 5—15 grs. in water will relieve local pain and neuralgia like morphia, but it causes smarting and local sores.

The writer now generally gives the drug in combination with caffeine as in the recipe appearing upon page 345.

In *pleuritis* it is claimed that small doses cut short the attack, and have a surprising effect upon the absorption of the effused fluid. The writer is satisfied that 5 grs. every three hours give the most satisfactory results in *influenza (Grip)* and in *inflamed sore throat*, and if the drug be given early in the first-named disease the attack is modified and complications do not occur, and a fatal issue is exceedingly rare.

Phosphorus in *minute* doses is a tonic and stimulant to the nervous system, probably by acting as a restorative and supplying food to nerve tissue. The mental faculties seem more active, the circulation is quickened, and the pulse rises ; the temperature is said to rise also ; the products of waste are increased in the urine ; and the appetite increases, whilst the nutrition of the body also is improved. After a considerable time the bones are affected, osseous deposit filling up the medullary canal, and it has been proved by Wegner that the cancellated tissue becomes compact bone.

In larger doses, vomiting, purging, albuminuria, and the ordinary signs of irritant poisoning supervene, only they may first show themselves *several days after the first dose has been taken* —with cardiac weakness, reduction of temperature, jaundice, convulsions, and death, after which are found fatty degeneration of the liver, blood vessels, and muscular tissue generally. These symptoms are not unlike those observed in *acute yellow atrophy of the liver*.

In chronic phosphorus poisoning the hepatic connective tissue is increased and cirrhosis results, with marked fatty degeneration.

This latter change is produced by the *increased metabolism* and *diminished oxidation* which characterise the action of the drug, the fat being derived from the rapid splitting up of the albuminous tissues of the body.

From its restorative effect upon the nervous system, phosphorus has been extensively tried in *neuralgia*, on the ground of this affection being always associated with a more or less impoverished condition of the diseased nerve. Sometimes benefit follows its administration, but more frequently it fails utterly. It is valuable in cases of *simple brain exhaustion* from prolonged mental strain; and in many diseases characterised by wasting or atrophy of the nerve centres its good effects have been occasionally observed. It acts upon the centres which preside over the *reproductive act*, and is an aphrodisiac in cases of functional loss of power.

In affections depending upon mal-nutrition, as *pernicious anæmia, or leucocythæmia*, phosphorus will be found useful. Kassowitz has reported the results of 560 cases of *rickets*, and states that cranio-tabes of a most marked character, involving both the occipital and parietal bones, disappeared completely in from four to six weeks, and children who had never been able to stand or sit upright were found running about after taking phosphorus for one or two months. The dose for a child 12 lbs. weight was from $\frac{1}{100}$ to $\frac{1}{50}$ gr. in the day. The writer in his "Dictionary of Treatment" has ventured to point out a possible danger in giving this drug in some cases of rickets, as it may cause the bones to harden in their bent condition. Phosphorus has been used in *tubercular meningitis* and *diabetes*, but with very doubtful benefit. Its stimulating action upon the skin has led to its questionable employment in developing the suppressed rashes of the eruptive fevers, and as a substitute for arsenic in *chronic scaly skin diseases*. From its influence over the growth of bone, it will be of great service as a constitutional treatment for *ununited fractures*, especially during pregnancy, and for *osteomalacia*.

The *fumes* of phosphorus cause disease of the jaws, leading to exfoliation of the bone; this action is a local one, caused by the vapour reaching the alveolus through a decayed tooth. It does not follow the internal administration of the drug, even in poisonous doses, and only affects those exposed in the manufacture of lucifer matches who have caries of the teeth.

Not more than $\frac{1}{80}$ grain should be given at first, and its effects should be carefully watched. The phosphorated oil may be given in gelatin capsules, each containing 2 minims, or 1—2 grs. of the recently prepared official pill may be prescribed. The writer prefers to give it in rickets in combination with cod-liver oil—30 to 40 minims of B.P. phosphorated oil mixed with 6 ounces cod-liver oil—the dose of the mixture being 1 dr.

For *Phosphate* and *Hypophosphite of Calcium* and *Phosphoric Acid*, see under Calcium and Acid. Phosphoricum. None of these substances possess the therapeutical virtues of free phosphorus, which enters the system and remains in the blood as the element, phosphorus, and not, as has been supposed, after its conversion into phosphoric acid or a salt. Compounds in which the affinities of phosphorus are not completely saturated produce poisonous results not unlike phosphorus. They are not, however, used medicinally.

Physostigma and Eserine—Calabar bean is a deadly poison, long used by the West Africans as an ordeal for determining the guilt or innocence of suspected witches.

Minute doses cause vomiting, colic, and diarrhœa, and stimulation of the voluntary and involuntary muscles throughout the body, with increase of blood pressure and salivation. Repeated doses of 2 grs. of the alcoholic extract soon produce more serious symptoms—the *anterior*, and to a less extent, the *posterior cornua of the cord* become depressed, producing motor paralysis, extinction of reflex irritability, and only partial loss of sensation. After poisonous doses the cerebrum remains unaffected and the mind is clear; the pupils sometimes but not always contract; the respiratory centre is soon paralysed, producing death by asphyxia, through stoppage of the respiration. Though the heart continues to powerfully contract, according to Binz, marked fibrillar contractions of the lumbar, and other muscles continue after death, probably from the action of the poison on the muscular tissue.

Physostigma contains two alkaloids—Eserine or Physostigmine and Calabarine; the former produces effects resembling those produced by the bean itself, whilst the latter causes tetanic convulsions like strychnine. They are excreted by the saliva and bile, but not by the urine.

Physostigmine is antagonistic to strychnine and atropine, and may be tried in cases of poisoning by these drugs. It has been used in *tetanus*, and in various convulsive diseases, in *chorea*, *paralysis agitans*, *acute mania* and *general paralysis of the insane*, and in minute doses for *chronic constipation* and *bronchitis* with the view of stimulating the involuntary muscular fibre ($\frac{1}{3}$ grain of the extract). It should be given hypodermically. It is for its local action that Calabar bean is so valuable in ophthalmic practice; the alkaloid—Eserine—applied to the conjunctiva produces contraction of the pupil, diminishes intra-ocular tension, and causes spasm of accommodation. The official discs or a few drops of a solution of the sulphate (2 grs. to 1 oz.) are used for this purpose—(1) to counteract the effects of atropine; (2) to prevent prolapse of the iris after *wounds of the cornea;* (3) to diminish the amount of light falling upon the

retina in hypersensitive states or inflammations of the eye, as in *strumous ophthalmia*, *ulcers*, &c.; (4) to diminish intra-ocular pressure in *glaucoma* and *perforating keratitis;* (5) used after atropine to break down the adhesions resulting from *iritis*. It has proved beneficial in *detachment of the retina*.

Picrotoxin, externally as an ointment (1 gr. to 1 dr.), kills *pediculi*, but it must be used with caution. Internally it is, in doses of a few grains, a powerful poison, irritating the respiratory and other centres in the medulla, and producing violent spasmodic muscular contractions from its stimulating action upon the cerebral and spinal motor centres. It has been used in *epilepsy*, especially in the nocturnal variety, in *paralysis* affecting the muscles of the pharynx, and in *sick headache*. It is, however, to check the *night-sweating of phthisis* that this drug has been much used, and good results have been obtained by Murrell, who first introduced it, in doses of $\frac{1}{200}$ to $\frac{1}{100}$ gr., three times a day.

It may be given in pills, and the dose increased to $\frac{1}{25}$ gr., or in solution with a little acetic acid; or hypodermically, $\frac{1}{30}$ gr. It is antagonistic to the action of chloral hydrate.

Pilocarpine. (See Jaborandi, page 408).

Pimento, like cloves, is a stomachic, and though in large doses it acts as a stimulant of some power, still it is seldom employed in medicine, except as a flavouring ingredient or adjuvant to purgatives. Like pepper, it improves digestion and increases the vascularity of the mucous membrane, when mixed with food. Hence it may be taken as the type of a condiment.

Pinus Pumilio, or Mugho or Mountain Pine—Under the names of Pinol, Pumiline, Ol. Templinum, and Krummolzol, this remedy has been used as an inhalation in pulmonary complaints, and is the basis of the "pine-cure" practised at various health resorts. Inferior terebinthinate products from the same pine are used in baths for *rheumatism*, *sciatica*, and *gout*.

The B.P. oleum pini may be taken internally (5 minims) in *bronchitis* and all wasting lung diseases; it is excreted by the bronchial surface and acts as an astringent and expectorant. It may be used as a spray, or inhalation, or the vapour may be inhaled from the handkerchief, or it may be put into any of the various respirators or inhalers, thus the phthisical patient may be enabled to live in an atmosphere saturated with the oil, as it possesses only very slight irritating qualities. In this way at home the benefits of a stay at Arcachon may be to some extent enjoyed. Dr. Davidson has obtained excellent results from this treatment at Bournemouth.

Piper Nigrum resembles pimento in its stomachic qualities. It has been supposed to possess febrifuge properties on

insufficient evidence. It is eliminated by the kidneys, which it stimulates, and it increases the amount of their secretion, but its diuretic action is uncertain ; it imparts to the urine a characteristic odour. In passing over the genito-urinary tract it exercises a beneficial influence upon the bladder and urethra, and has the power of bracing up the relaxed and chronically inflamed mucous membrane of these parts in *gonorrhœa* and *gleet*. In this respect its action resembles that of cubebs ; it may stimulate, by reflex action, the genital organs, and possibly aggravate matters in the acute early stages of the disease. The *excess* of the remedy which passes through the intestines unabsorbed is decidedly beneficial in inflamed and relaxed conditions of the mucous membrane in the neighbourhood of the anus. In *hæmorrhoids* its good effects will be found by giving the official confection in tea-spoonful doses three times a day. If cubebs be added, and copaiba balsam substituted for the honey, a preparation results which will seldom fail to arouse a healthy action in relaxed and painful affections about the anus ; or the following may be used with or without the cubebs :—

℞. *Pulv. Piperis Nig.*
„ *Carui Fructus*
„ *Cubebæ ana* ℥ss.
Glycerini q.s. Misce.
Fiat electuarium, capiat coch. parv. ter in die.

Pix Burgundica is a mild rubefacient, and its physical qualities render it suitable as a basis for plasters, which are used in *lumbago*, *rheumatism*, and various painful *joint* and *nerve* troubles, where they act by stimulating the lymphatics and protecting the parts from variations of temperature.

Burgundy pitch has been supposed to exert some special action upon the rectum, and has been employed for *hæmorrhoids*, made into pills with the following liquid.

Pix Liquida—Wood tar contains amongst its complex constituents some creosote and turpentine, upon which many of its properties depend. It is thus antiseptic and stimulating, and possesses considerable power in checking profuse bronchial secretion ; and as an expectorant is decidedly superior to any compound which can be distilled from it. It probably exerts its beneficial tonic effects upon the bronchial mucous membrane in the act of its elimination. Yeo finds that tar exhibits its expectorant qualities either when swallowed, inhaled as spray, or used as a fumigation. Ringer advocates its administration in *winter-cough*.

Tar possesses decided advantages over creosote and carbolic acid in the treatment of *chronic scaly skin affections*. It is a powerful stimulant when applied to a healthy sensitive skin, and often causes considerable inflammation and pain, especially in regions where there is much hair. In *psoriasis* the ointment of tar sometimes cures ; and in *chronic eczema*, with painful itching, it occasionally will be found to relieve the itching, and, at the same time, to remove the disease which causes it.

The internal administration of tar in 5 or 8 minim doses, gradually increased to 15 minims, in pills or capsules, is employed by Anderson in *chronic eczema.*

Tar water is made by adding 1 part of tar to 4—100 parts of water, and, after agitation and subsequent rest, on being poured off it makes a good stimulating lotion for *wounds* and *sluggish ulcers*. As a means of administering the remedy, it may be taken in 10 oz. doses ; 3 grs. of tar may be made into a pill with 1½ grs. lycopodium.

Pix Carbonis Præparata—Coal tar has the same action as wood tar.

Chaplin advocates his "creosote chamber," which is a small room where the fumes of tar over a spirit lamp are inhaled for about one hour in cases of *fetid expectoration*, *bronchiectasis*, &c.

The Liquor Picis Carb. is now the representative of the old Liq. Carb. Detergens, which the writer has found to be the best known remedy for *chronic eczema.*

Hutchinson recommends a lotion of 1 oz. Liq. Plumbi Subacet. and 7 ozs. Liq. Carb. Deterg. A tea-spoonful mixed with 10 ozs. water, as a lotion, to be applied on lint to the parts at night, and covered with oiled silk, and an ointment consisting of ½ dr. of the Liquor Carbonis, ½ dr. Liquor Plumbi, 15 grs. White Precipitate, and 1 oz. Vaseline, to be applied in the day-time. The liquor upon being added to water makes an emulsion, which is a powerful antiseptic, and can be used for *foul wounds*, *putrid sore throat*, or taken internally in *bronchial affections*, *winter-cough*, *hæmorrhoids*, &c.

Plumbum—All the salts of lead are more or less poisonous, though the acetate is the only one used internally, and when administered for a time they give rise to definite and easily recognised symptoms. There is loss of appetite, wasting, pallor, and constipation, followed by slowing of the pulse and heart's action, with violent colicky pains, cramps in the flexor muscles, and evidence of muscular impairment, as seen in paralysis of the extensors of the forearm, causing drop-wrist ; occasionally headache, stupor, and convulsions are observed.

Lead becomes fixed in all the tissues, chiefly in the central nervous system, and in the affected muscles. These at first

present no sign of change on the application of electricity ; but as the paralysis lasts the current seems to have less and less effect, till finally it does not cause any contraction, and the muscular fibres become the seat of fatty degeneration, and finally may lose all traces of striation. The change probably is of spinal origin, since it occurs in groups of muscles which act together, as in the forearm and hand ; the deltoid and the laryngeal muscles are occasionally affected, and paraplegia, and even hemiplegia, may show themselves, and finally the lead deposited in the brain may cause delirium, convulsions, and coma.

The joints get stiff and very painful, probably owing to gouty changes, for lead prevents the excretion of urates by hindering the decomposition of uric acid. The structure of the liver and kidneys becomes affected, causing slight jaundice and albuminuria. The urine, at first scanty, becomes abundant and clear. It has been shown that the red blood discs are destroyed. A blue line appears along the gums, near to the teeth ; it is caused by the metal deposited in the tissue of the gums being converted into a sulphide by the action of sulphuretted hydrogen generated from the decomposition of fragments of food remaining between the teeth. It is best marked over the region of the incisors, and is absent or indistinct where the teeth are away.

The walls of the arteries contract, the blood pressure rises, the pulse slows, and becomes tense and full. The vascular condition being almost identical with that found in cases of contracted kidney. At a later stage it is absolutely identical. The nervous system is seriously affected by lead, the changes in the sensory nerves giving rise to various neuralgic symptoms throughout the body ; thus, gastralgia and sciatica may give trouble, sensibility to touch becomes diminished, and especially about the upper part of the body may this be noticed. The optic nerve occasionally suffers, producing amaurosis.

Abortion often results from lead poisoning, either on account of the toxic power of the drug on the fœtus or from its influence over the muscular tissue of the uterus.

Lead is eliminated by the urine, bile, intestines, and skin, but chiefly by the intestines.

As the different salts of lead have slightly different actions they may be referred to under their different names.

Metallic Lead is inert in the system till converted into a soluble salt by acids, as those of the stomach.

Acetate of Lead is a valuable astringent. It combines directly with albumen, forming albuminate of lead, and when a strong solution is applied to a fresh wound or sore, a film of this substance imperfectly glazes it over. It causes contraction of the vessels when applied in weaker solution ; thus, it directly diminishes the blood supply, and checks excessive secretion in

ulcers, *wounds*, and most *local cutaneous inflammations*. *Itching* is often relieved in this way, and a weak solution (5 grs. to 1 oz.) makes a good injection in *gonorrhœa* and *gleet*. In the painful, red, and inflamed stage of *eczema*, characterized by much serous discharge or weeping, lotions of lead give relief by constringing the small vessels, diminishing pain, itching, and discharge.

Lead Collyria should not be used in ulceration of the cornea on account of the danger of their forming opaque deposits in the tissue, interfering with sight.

Internally, the acetate finds its way into the blood, probably as an albuminate, and by its astringent effect upon the smaller vessels it diminishes the secretion of the bronchial tubes, stops *hæmorrhages*, as in *hæmoptysis*, and controls *diarrhœas*. 2 to 5 grs. may be given every two or three hours in these affections, and there is little danger of lead poisoning. It is very doubtful that lead has any remote astringent action as in *hæmoptysis ;* the following may be tried—

℞. *Plumbi Acetatis gr.* xxxij.
Liq. Morphinæ Acet. ℥iss.
Acidi Acetici Diluti ℥j.
Aq. Destillatæ ad ℥viij. *Misce.*

Fiat mist. sumat cochlearia ii. *ampl. secundis horis.*

The *Subacetate Solutions of Lead* act like the acetate, and are generally confined to external application, where their unirritating astringent action renders them invaluable in *local cutaneous* or *superficial inflammations*, and *erysipelas*.

A valuable astringent application to *sprains*, &c., may be made by mixing Liq. Plumbi Subacet. ℥ss ; Acid. Acetic. Dil. ℥j ; Spirit. Vini Rectif. ℥iss ; Aquæ Rosæ ad ℥xij.

Carbonate of Lead is only used externally as a sedative and astringent application to excoriated or inflamed surfaces, either in the form of ointment or in fine powder dusted over the affected spots ; white paint relieves the pain of *burns*.

The *Oxide* possesses similar desiccant properties, but is seldom used.

Iodide of Lead combines the alterative qualities of iodine with the astringent properties of lead. It is supposed to have a beneficial action in *scrofula*, but is seldom given internally.

Externally, it is used in the form of a plaster or ointment.

The various plasters containing lead most probably act entirely independent of their metallic constituent, which is not absorbed in this form into the system. They act mechanically, as before explained, by causing such pressure when properly

applied as will alter the circulation, and, acting as a stimulus to the lymphatics, will assist the removal of effused products or *indolent enlargements*. By covering up the affected or diseased parts, they protect them from all sources of external irritation, especially from changes of temperature, and promote a more rapid interchange between the blood and the tissues, hastening repair, and at the same time, in the case of *diseased joints*, securing some degree of rest. The superficial spot so treated is placed upon the same favourable conditions as a deeper part.

In chronic lead poisoning, iodide of potassium is used to dissolve out the insoluble metallic compounds lodged in the nerves, viscera, muscles, and brain, but its administration must be backed up with purgatives, especially saline sulphates, which will cause removal of the soluble salts of lead eliminated by the intestines. Sulphur baths may be employed, and the tone of the affected muscles must be kept up by friction and the free use of the slowly-interrupted current. Alum has also been used with success, and belladonna is very useful in lead colic and paralysis.

As a prophylactic treatment to those much exposed to the fumes or dust of the lead compounds, lemonade made with sulphuric acid, instead of citric or tartaric, has proved beneficial; and a diet largely composed of milk has the power of preventing the poison affecting the system. Scrupulous personal cleanliness is a very important point.

Podophyllum root and resin are active cathartics. The latter is the form in which the substance is generally administered. It is an irritant when applied to the surface of the body; and the dust produced by powdering it, coming in contact with the skin, causes sores, and keeps the eyes in a state of chronic irritation.

It produces free purgation, with watery stools, by irritating the mucous membrane and acting as a powerful stimulant to the intestinal glands, whose secretion it greatly increases. The most of its force is spent upon the duodenum, whose contents it sweeps rapidly down the tube, resembling in this respect calomel; and hence the name frequently given to it of "vegetable calomel." The resemblance ends here, for podophyllin does not possess any of the *alterative* properties of calomel. Podophyllin will purge when injected into the veins, cellular tissue, or serous cavities, or if applied to an ulcerated surface.

In its action podophyllin closely resembles jalap, only ordinary purgative doses ($\frac{1}{6}$ to $\frac{1}{2}$ gr.) are more tardy in producing their effects, and are much more variable in their results upon different individuals. Sometimes $\frac{1}{4}$ gr. of the resin purges in a few hours, while $\frac{1}{2}$ gr. in another individual will not operate for 10 or 14 hours, and in a third may produce no purgation at all.

Florid individuals, or those with much red pigment in their hair, may be often noticed to be very susceptible to the action of the drug. Often great pain results from the administration of podophyllin, especially from impure samples of the resin; common salt increases the cathartic properties.

Rutherford found that it produced decided stimulation of the liver, and marked increase in the amount of bile secreted. The bile is its proper solvent, but if a large dose of the drug be given the hepatic secretion in which it is dissolved is not absorbed, but is swept along the intestines, and the liver is less stimulated than if only moderate quantities had been administered. In doses sufficient to cause severe purgation the biliary secretion is decidedly diminished.

These effects upon the liver and intestines give podophyllin a high place in the treatment of various diseases of the *liver* and *bowel;* thus for passive congestion or *hepatic torpidity*, or *obstinate constipation*, ½ gr. of the resin will be found a valuable remedy, relieving the portal circulation speedily. The danger of griping will be removed by the addition of extract of belladonna or hyoscyamus; and if combined with some good cathartic pill, as aloes or colocynth, its action is much more certain and uniform, though Wood believes that owing to the tardiness of its operation it should not be combined with speedy cathartics. He advises its combination with calomel, which takes about the same time to act. This must be also advantageous from another point of view, because calomel and podophyllin act upon the same portion of the small intestine, and must consequently intensify each other's effects.

By such a combination of purgatives as colocynth, podophyllin, jalap, and aloes, we get a more valuable intestinal stimulant than if any one be ordered singly in a large dose. By this means we also ensure an action possessed by no solitary drug, since the entire intestinal tract from the stomach to the anus is equally stimulated.

℞. *Extracti Hyoscyami gr.* ij.

Resinæ Podophylli gr. ¼.

Extracti Colocy. Co. gr. iij. *Misce.*

Fiat pil. mitte tales xii., i. *pro re nata, hora somni.*

Potassium—All the salts of potassium act in *large* doses as powerful poisons independent of the acid with which they may be chemically combined. The spinal cord and nerve centres are paralysed, the heart is depressed, and its movements rendered slow and irregular; and there is a fall of temperature and blood pressure.

One large dose of any potassium salt injected into the veins of an animal causes sudden arrest of the heart's action and death. Ringer believes that the potassium salts act as pure protoplasmic poisons, destroying all nitrogenous tissues, the more highly organised nerve centres suffering first.

After a time the blood becomes thin and poor when the administration is protracted, and there is loss of weight from absorption of the fat deposited throughout the body, the digestive organs are interfered with, and large doses cause paralysis of the muscular coat of the stomach and intestines. In small doses these salts are restorative, supplying the place of those used up in the blood corpuscles and in muscle. Potassium salts exist normally in the *solid* tissues, whilst sodium salts abound in the fluids of the body. Most of them are diuretic and slightly purgative. The salts of potassium possess higher diffusive power and more readily enter the blood than the sodium salts. They increase the formation of *bile*. The soda salts should always be selected in preference to the potash salts, where prolonged administration is necessary, owing to the powerful depressent effects of the latter on the heart and brain. There are, in many points, close resemblances between the potassium and sodium salts, and they may be taken as the representatives of a very important chemical class of therapeutic agents—the alkalies.

The alkalies when admitted to the stomach act as direct stimulants, and may increase the quantity of gastric juice when given before food ; and thus their utility in *atonic dyspepsia*, and their power for harm in irritative gastric complaints. Ringer's law in reference to acids holds true conversely when applied to alkalies—*i.e.*, that alkalies check all alkaline secretions, while they stimulate all secretions of an acid reaction.

Potassa Caustica—From its affinity for water, and its power of dissolving albumen, this substance when applied to the tissues causes their rapid destruction, producing an extensive eschar. Its destructive action being both deep and wide, its use must be restricted to such parts where no vital organs or structures are within reach. Its deliquescent properties cause it to run over the skin if allowed to remain in contact with it long ; hence it is desirable to circumscribe its action with a ring of adhesive plaster, or with some adhesive cerate of firm consistence.

When the solid stick is applied to the skin for the destruction of any very superficial part, a contact of short duration will suffice, and blotting paper should be applied to absorb the moisture, else the eschar will be much deeper than is intended. *Cancers of epithelial* origin may be often satisfactorily treated in this way. It was used for making issues, and is still employed in opening *abscesses* or *cysts* in the interior of the abdomen, or in the substance of the liver. A series of mild applications of the caustic excites

such inflammation that the abscess or cyst wall becomes glued to the abdominal parietes, when it may be opened with the knife or with further applications of the caustic without any danger of the contents escaping into the peritoneal cavity. *Unhealthy*, *foul ulcers* showing a tendency to spread by sloughing, may be destroyed with caustic potash, and its efficacy in various chronic indurated conditions of the *os uteri* is highly spoken of. In these cases the good effects are not so much owing to the destruction of diseased tissue as to the alteration in the diseased action which always follows the free use of the caustic. The caustic, apparently, acts as a powerful stimulant to the healthy tissues, hastening repair and growth, and substituting a healthy inflammation for some abnormal tissue change.

The deliquescent properties and severity of action are corrected by mixing it with rather more than its own weight of lime, and making it into a paste as required, with rectified spirit of wine; this is known as Vienna paste—a safer, milder, and more manageable remedy than the pure caustic potash. Internally, it is never given in the solid state, since small quantities would act like the powerful corrosive poisons, and cause death by destroying the mucous membrane of the stomach and gullet.

Liquor Potassæ is the form in which caustic potash is administered internally, though if given in its undiluted strength it is a powerful corrosive poison. Applied to the cuticle it dissolves it, and is used for *in-growing toe nail*, with a view of softening the nail and facilitating its removal. As a lotion it is likewise useful in *skin affections*, where it may be employed either to partially dissolve or hasten the removal of scales, as in *psoriasis*, or to allay the itching of *eczema*, *urticaria*, &c.

Internally, when Liquor Potassæ or any solution of the hydrate (largely diluted) is swallowed it readily finds its entrance into the blood on account of its easy diffusibility, but it first neutralises any free acid with which it comes in contact in the stomach; it acts thus as an antacid, either locally or after its admission into the blood.

Hence it has been used to check excessive acidity anywhere, as in *irritative dyspepsia*, or acid conditions of the urine, leading to uric acid deposits; but if given in doses sufficient to produce this remote antacid effect it will be often found to irritate the stomach, and, consequently, it is not so valuable as the less irritating salts. It increases and liquefies the secretion in *bronchitis*, and has been given in the various forms of *rheumatism* and *gout*. It is diuretic to some extent, as it passes out by the kidneys, but it possesses less power (in safe doses) over the state of the urine than the citrate and carbonates. It does, however, cause an increase in the nitrogenous elements of the urine, possibly by encouraging the various tissue changes or destructive metamor-

phoses throughout the body, and not by any mere diuretic action of the drug. It has been used in *obesity*.

It appears to possess special sedative influence over the *bladder* and *urethra*, and its use in various irritable conditions of these parts, caused by unhealthy urine passing over them, is more liable to be followed by good results than if any of the salts had been given, the bicarbonate or citrate excepted.

Small doses, given with a vegetable tonic before meals, increase the flow of the gastric juice by acting as a direct stimulant to the mucous membrane, in the same way that acids given before meals correct or prevent the excessive secretion of acid juice.

Potassa Sulphurata possesses the properties of the sulphur compounds in a more marked degree than those of the potassium salts, and will be referred to under Sulphur.

Potassii Acetas, Citras, and Tartras—These salts, in moderate doses (about 30 grs.) enter the blood speedily. They circulate along with it, acting as restoratives to the corpuscular elements and muscles and the various tissues containing potassium salts; reaching the kidneys the excess is secreted in the urine. Before passing out of the body the salts of potassium, with vegetable acids, are converted into carbonates or bicarbonates, increasing the alkalinity of the blood and rendering alkaline the acid urine. The alkalinity of the urine results even if the salts contain an excess of acid, and may occur, though slightly, after the use of the acid tartrate; and since they possess no local corrosive action, but may be taken in doses ten to twenty times larger than is necessary to produce their diuretic effect, they may be administered freely. Though the reaction of the urine is thus altered from acid to alkaline, still its *total* quantity of acids in a state of combination may be augmented.

In this way the urine may be kept alkaline for many weeks, and during that time small uric acid stones in the kidney may be dissolved or so reduced in size that they may pass down the ureter and be expelled through the urethra. In health these salts often fail to increase the amount of urine.

In large doses, the tartrate, citrate, and acetate of potassium act as purgatives, from $\frac{1}{4}$ to $\frac{1}{2}$ oz. in solution being generally enough to cause mild catharsis. They are diaphoretic and febrifuge, opening up the cutaneous circulation by causing dilatation of the superficial capillaries, and the resulting perspiration affords one way for the extraction of heat from the body. It is, however, probable that at the same time they cause such alterations, either in the density or composition of the blood, as prevent or retard the changes taking place in that fluid upon which the increased temperature of the body may depend.

In *acute rheumatism* these salts are found beneficial; by increasing the alkalinity of the blood they counteract the effects of the rheumatic poison, and thus reduce the body heat and assist in the cure of the disease. Their antacid properties do not, however, account for all the good they do in acute rheumatism, for they probably exercise a *sedative* influence over the nervous system, though it is by no means clear that they materially shorten the length of the attack. (See Potassii Bicarbonas.)

The *acetate* of potassium is the most certain diaphoretic of the vegetable potassium salts; the *citrate* is the most reliable diuretic; whilst the *acid tartrate* possesses the most pronounced cathartic properties. The citrate is more commonly ordered than any other potassium compound, since it is this salt which is formed when the carbonate or bicarbonate is administered in effervescence with lemon juice. In this form the citrate is an elegant gastric sedative, and it is beneficial in irritable conditions of this organ; with the addition of a little morphine no combination gives such relief in *phthisis* when the skin is hot and dry, the cough harrassing, and the tongue furred. The good effect in such cases is to some extent owing to the carbonic acid gas coming in contact with the peripheral nerves of the irritated mucous membrane. These salts (especially the citrate) have been recommended in *scurvy* by those who believe that the disease is caused by a deficiency of potassium in the system.

It is the *citrate* which should always be selected when we wish to act upon the urine and keep it alkaline for any considerable length of time, because this salt has the slightest destructive action upon the blood and is the least likely to derange the digestion by its prolonged administration. (See recipe on page 310).

℞. *Potassii Acetatis* ℥iss.
Liq. Ammon. Acet. ℥ij.
Syrupi Aurantii ℥ss.
Aq. Camphoræ ad ℥viij *Misce.*
Fiat mistura, capiat cujus ℥j. *quartis horis.*

The *acid tartrate* may be given with sliced lemon in hot water, sweetened with a little sugar. Its purgative power is increased if it be administered in less water than will dissolve it; and there are few more agreeable laxatives than a paste made of cream of tartar and orange marmalade. The mildness of its operation recommends its use in the reflex constipation

caused by painful *hæmorrhoids*, in which case it may be combined with sulphur, as in the official confection, or it may be given with marmalade.

℞. *Potassii Bitart.* ℥j.
Conservæ Aurantii (Keiller) ℥iv.
Sulphuris Præcip. ℥ss. *Misce.*
Fiat electuarium, cujus capiat cochleare magnum omni mane nocteque.

Potassii Carbonas resembles in action the liquor potassæ. It is corrosive to some extent, and a large dose causes death by destroying the tissues with which it comes in contact, though its effects are not so severe as are those following caustic potash or the liquor. It is seldom given in medicine, the bicarbonate possessing all its virtues without its irritative qualities. It is eliminated as carbonate in the urine.

Potassii Bicarbonas—This salt possesses all the virtues of the potassium compounds, without any local corrosive or irritative action. It is a mild antacid ; given in small doses, it stimulates the secretion of the gastric juice before taking food, and thus is beneficial in *atonic dyspepsia*. In *painful gastric affections*, accompanied by excessive secretion of acid and acrid fluid after meals, if administered in large doses it counteracts acidity, and often gives instant relief, though its continued administration in such cases is not productive of permanent benefit. In *gastralgia*, not evidently depending upon excess of acid secretion, the bicarbonate relieves by its local soothing or sedative action, possibly by giving off carbonic acid gas as it comes in contact with acids.

It makes the blood more alkaline, and is excreted as carbonate by the kidneys, which it stimulates. Passing over the mucous membrane of the genito-urinary tract, it either exercises its direct sedative influence, or else, by rendering the urine less irritating it soothes the inflamed surfaces in *cystitis*, *gonorrhœa*, *pyelitis*, &c. It may well be combined in such cases with buchu, pareira, or hyoscyamus. If the urine be already alkaline and decomposing, causing irritation by the rapid formation of ammoniacal compounds in the bladder, the potassium salts may do harm. If the irritation be caused by the presence of an abnormal amount of uric acid, then the bicarbonate gives relief.

There is much difference of opinion about the value of alkalies in *acute rheumatism ;* but though it is unproven that this treatment possesses the power of cutting short the disease, still it is a well-recognised fact that the alkalies afford marked relief in this affection. It is possible that the beneficial effects of the

drug do not depend upon its neutralising the supposed excess of acid in acute rheumatism, but from its so altering the composition of the blood that the changes in this fluid, caused by the rheumatic poison, are less easily effected.

In *rheumatoid arthritis* and *chronic rheumatism* benefit is found from the free administration of the bicarbonate if combined with the iodide of potassium.

It should be remembered that the alkalies, when given for a long time in medicinal doses, cause deterioration in the quality of the blood and diminish the weight of the body; and thus a tardy convalescence may result after the disease, for which they are administered, is cured.

The best form in which to give the bicarbonate of potassium is effervescing with lemon juice, one table-spoonful of which will be found to neutralise 25—30 grs. of this salt; but the alkali may be in any excess that the physician considers his case demands. (See R. on page 310.)

A solution of citric acid may be used as a substitute for fresh lemon juice when the fruit cannot be obtained, but the natural juice is always to be preferred.

Potassii Bichromas is used in the making of chromic acid; it formerly was used for its supposed alterative action in *syphilis*. A saturated solution is employed as a caustic, brushed over *superficial growths*, especially of a syphilitic character. $\frac{1}{6}$ gr. would be an average dose of this drug; two or three grains will act as an emetic. A peculiar ulceration of the hands, face, and septum nasi attacks persons working with this drug. The ulceration does not come on unless there has been a previous abrasion.

Potassii Bromidum and Iodidum. (See under Bromum and Iodum).

Potassii Chloras—As the greater part of this salt passes unaltered through the system, some authorities have been led erroneously to state that it produces no appreciable effect in the system after its admission into the blood.

Binz and Mering have demonstrated that a portion of this salt is reduced by decomposing fibrin and septic tissue, and that free oxygen is liberated in the blood.

In moderately large doses (20 grs.) it stimulates the kidneys as it is excreted by them, and a portion appears in the urine; it seems to act powerfully upon the kidneys, especially during pregnancy. In poisonous doses (1 oz.) it causes active congestion of these organs, with bloody and finally suppressed urine.

It is, however, for its influence over *unhealthy mucous surfaces* that this remedy will always keep a high place in therapeutics. This effect is witnessed when a solution is applied to the *spongy*

gums in various *aphthous conditions* of the mouth and throat, and in active *inflammations* of the *tonsils* and mucous lining of the *pharynx* and *nares*. A rational explanation of its action in these cases has yet to be given, and we must fall back upon such a term as "alterative" to explain its beneficial effects, for it seems by its local influence to alter in some way the unhealthy action of the membrane. One effect may be constantly observed when chlorate of potassium is used as a gargle in *follicular pharyngitis* or *acute tonsillitis*. Marked benefit at first follows its use, but if it is persevered in for any length of time, it keeps up a chronic irritation, which subsides only after its use is withdrawn. It appears to have an influence over the salivary and buccal glands, like what it has been observed to exercise over the mammary, viz.—it checks or moderates their secretion if excessive, and stimulates or increases it if scanty. It has been highly spoken of in excessive salivation from the injurious use of *mercury*.

After its absorption and entrance into the blood it appears to exercise the same alterative, stimulating, or regulating power over other mucous surfaces, especially the intestinal. In diseases of *childhood*, depending upon *catarrhal* and other *unhealthy inflammations* of the *mucous membrane* of the *alimentary canal*, from the mouth to the anus, the writer has found this drug invaluable. It is an expectorant in *bronchitis*.

In *scrofula* and various states depending upon a depraved or impoverished condition of the blood, chlorate of potassium has been highly spoken of, though it appears possible that many of its good effects in these cases may depend upon the iron which is so constantly prescribed along with it.

A solution of about 6 grs. to each fluid ounce of distilled water is a satisfactory application to *unhealthy sores* and *ulcers*, and may be used for washing out foul *sinuses* or *cavities*, and will be found a valuable stimulant in various chronic affections of the *bladder*, if injected twice a day. The powdered salt may be applied to *aphthous* spots on the *cheeks*, *tongue*, or *gums*, and has been found to alter the action, diminish the pain, and check the growth of *epithelial cancers*. Small pieces sucked in the mouth, by reflex action, excite effectually the secretion of healthy mucus in chronic *bronchial* and *laryngeal affections*, so that the expectoration is rendered more fluid or less adhesive, and is readily swept up by the cilia ; hence this salt is classed as a ciliary excitant.

Dr. Harkin pointed out its usefulness in *purpura hæmorrhagica*, *epistaxis*, *hæmaturia*, and a host of blood ailments. By some unpublished experiments on milking cows, he proved that it materially increases the quantity of milk.

Recent experience is showing that chlorate of potassium is not so inert as has been supposed ; already many cases of poisoning

have occurred on the Continent, and some from taking doses under 1 oz. Bohn suggests the possibility of the chlorate being the cause of death in some diseases in which it is administered as a remedy, and he gives two instances of death in diphtheria, closely resembling chlorate of potassium poisoning, the salt having been previously freely given.

In acute poisoning death may take place in a few hours, from the oxy-hæmoglobin of the blood being converted into methæmoglobin, producing a chocolate colouration ; this is owing to the irritation produced by the liberated oxygen ; there is vomiting, diarrhœa, dyspnœa, and cardiac depression.

Coghill believes that the action of the drug is *Catalytic—i.e.*, by its presence and mere contact it has the power *per se* of oxygenating the blood. Dr. Henderson gives a graphic description of the power of the drug in speedily relieving the great suffering caused by breathing the thin air of very high altitudes in the lofty passes of the Himalayas. There is a feeling against the use of the drug in *diphtheria*, owing to the deaths attributed to it, but many authorities praise it in this disease.

The following is a useful combination :—

℞. *Potassii Chloratis* ʒiij.
Tincturæ Ferri Perchlor. ʒii.
Glycerini ʒvj.
Aquæ Destill. ad ʒxii. *Misce.*
Fiat mistura, cpt. ʒi. *ter in die.*

Potassii Nitras—The salts of potassium, with the mineral acids, differ from the vegetable acid salts of potassium in passing through the system and being for the most part eliminated unchanged in the urine, whilst the latter are converted into carbonates.

The nitrate is a very active substance ; it rapidly enters the blood, and in large doses prevents its coagulability by its action on the fibrin. It so alters the red blood corpuscles that they soon cease to possess any power of carrying oxygen to the tissues. The first effect upon the heart is to render it slower in its movements ; afterwards it becomes quick and weak, and finally stops. Death may result from the violent irritant action of the salt on the alimentary canal, giving rise to severe vomiting and purging.

The salt is eliminated by the kidneys, during its passage through which it acts as a stimulating diuretic, appearing in the urine as nitrate. The skin is acted upon, this salt possessing very constant diaphoretic powers, which are increased if it be administered in some hot fluid at bed-time. A glass of whiskey

or brandy, with boiling water and sugar and half a dr. of the nitrate, affords a good chance of getting the hot skin to secrete abundant moisture in *febrile affections*, whilst it slightly reduces the pulse, and the temperature falls a little.

This refrigerant action of nitre is generally explained by its sedative influence on the circulation and its effect upon the skin. It is a diaphoretic and diuretic in all *inflammatory affections*, except where the gastro-intestinal or renal apparatus is involved. It is, probably, partially excreted by the bronchial mucous membrane, over which it appears to exercise an influence not unlike that which it effects on the skin, and it is a reliable expectorant when the irritation or inflammation is confined to the *trachea* or *larger divisions* of the *respiratory tract*. Bibulous paper soaked in a strong solution of nitre, dried, and allowed to burn slowly in the patient's room, has long been a favourite remedy in *asthma*.

The nitrate may be given with great advantage in a mixture of the citrate or bicarbonate in effervescence.

Potassii Permanganas is a powerful oxidiser, readily parting with its oxygen, which, on being freed, forms harmless compounds with foul-smelling gases and liquids, thus acting as a very efficient deodoriser. In a similar way it destroys the germs of disease, and thus is a disinfectant. It makes an elegant and not unpleasant gargle in fetid *ulcerations* about the *gums*, *mouth*, or *throat*, in the proportion of about 2 grs. of the salt in 10 ozs. of distilled water. This weak solution may be also used as a lotion to *suppurating sores*, or as an injection into suppurating *cavities* and *sinuses*, as in *ozœna* and *empyema*, or as an injection in *cancer* of the *os uteri*. 1 gr. to 2 ozs. water makes a most valuable application to *burns*, *scalds*, and *frost bites*. It should be prescribed with distilled water, and kept in stoppered bottles; or given in the form of pill (page 54) as it so readily parts with its oxygen. It is probably decomposed in the stomach before absorption.

As an antidote in poisoning by morphine the drug is invaluable, and a lethal dose of morphine may be swallowed with impunity if a few grains of the permanganate in solution be administered immediately after. The stomach should be washed out with it at intervals during the treatment of opium poisoning.

The writer has found better results from an injection of this salt ($\frac{1}{2}$ gr. to 1 oz.) in *gonorrhœa* than from any other local remedy. It is very valuable (1 gr. to 1 oz.) in *gleet*.

It has been given in grain doses in *diabetes*, and has been very highly extolled as a specific in *amenorrhœa* or *scanty menstruation*, given in 2 gr. pills; the writer has not been successful with it.

It has been used to counteract the poison of *snake-bites*, and F. E. M'Farland has recommended it strongly in *cholera*.

Potassii Sulphas is used to effect the minute sub-division of the particles of powders and pill masses. It is a mild cathartic, acting by increasing the intestinal glandular secretion; and is especially suitable for children. The experiments of Rutherford prove that it is a decided hepatic stimulant.

Prunum—The dried plum is seldom employed as a medicine, but it is freely used in domestic life as a food and sweetmeat. It possesses faint laxative properties, and when stewed makes a tempting dish for constipated children. It probably acts by increasing peristaltic action.

Prunus Virginiana—Wild Cherry Bark is a bitter *tonic*, acting on the mucous membrane of the stomach as a slight irritant, increasing its vascularity and secretion, like the older bitters, calumba, &c. This action is, however, somewhat antagonised by the tannin contained along with the bitter extractive, which at the same time confers *astringent* virtues upon the remedy. It contains also amygdalin and emulsin, which give a percentage of Prussic acid in the liquid preparations that confers *sedative* properties upon them.

The syrup is given in tea-spoonful doses to allay the cough and sweating of *phthisis*. The tincture in ½ dr. doses is a tonic in convalescence from acute diseases, and is useful in *dyspepsia*. Allbutt found the drug useful in cardiac *palpitation*, *mitral regurgitation*, and in *chronic bronchitis* with *fatty heart*, but its properties do not justify its introduction into the new B.P.

Pterocarpi Lignum has faint astringent properties depending upon traces of tannic acid which it contains. It is used solely as a colouring agent in Tinct. Lavand. Co.

Pyrethri Radix, when chewed, acts as a powerful stimulant to the salivary glands, causing a sudden increase in the quantity of saliva by its direct irritant action. It has been thus used to relieve the pain of *carious teeth*, and as a masticatory in *paralysis* of the *tongue* and relaxation of the *uvula*. Its pain-relieving properties are very uncertain, though the tingling and unpleasant sensation which it causes in the mouth will always to some extent mask pain; and it appears to blunt the sensibility of the nerves distributed to the lining membrane of the mouth. Internally, it has been given in *globus hystericus* by Roth, who reports very favourably of it. He believes it acts by stimulating the sympathetic.

The writer has employed it with success as a rapid method of having *iodide of potassium eliminated from the system in chronic poisoning by that drug.*

The tincture may be used as a *mouth-wash* in the proportion of a tea-spoonful to a wine-glassful of water; or it may be

applied in its undiluted state on cotton wool to the cavity of the diseased and painful tooth.

Pyroxylin is only employed in making Collodion.

Quassia is a pure bitter tonic, devoid of astringency; it is used in *dyspepsia* and *anorexia*. It closely resembles calumba (which see), and, like it, may be given with the preparations of iron, since it contains no tannin.

It possesses toxic properties when eaten by flies and fish, and has been supposed to act in a similar way in various diseased conditions of the blood, destroying unhealthy organisms, and acting as a true febrifuge, like quinine, but only very doubtful success has resulted when thus administered, possibly because too small a dose has been used. When injected into the rectum a strong infusion will cause the death of the *thread worm*.

℞. *Infus. Quassiæ* ℥xj.
Tinct. Quassiæ ℥vj.
Tr. Ferri Perchloridi ℥ij. *Misce.*
Fiat mist. cujus capiat cochlearia duo ampla ter in die.

Quillaia contains saponin or senegin, the active glucoside of senega, and it is a more powerful expectorant than senega. It is indicated in *emphysema* and *chronic bronchitis*, but not in hæmoptysis. (See Senega.) It contains five times as much saponin as senega, and may be used to make emulsions. Trechinski has found it of great service in acute and chronic catarrhal *rhinitis*. He directs the patient to shake up the powdered bark in a paper bag, and breathe the dust arising from it. It has been reported as valuable in *amenorrhœa*. Kobert shows that saponin is a mixture of a harmless substance—lactosin—with sapotoxin, a dangerous blood poison, which breaks up the blood corpuscles. Shoemaker has used soap bark with success as a local stimulant to *chronic ulcers* by applying bandages soaked in an infusion. He uses the same treatment in *hyperidrosis* and *bromidrosis*, *dandruff*, and simple *pityriasis*.

Quinine. (See under Cinchona.)

Resina is not administered internally; it is used solely for its adhesive property and for making various fatty mixtures of suitable consistence for ointments. It has, however, feeble stimulating qualities, and is much used when made into an ointment with wax, lard, and oil as a mild stimulant to *sluggish ulcers* and *slowly healing wounds;* it appears to act in such cases by causing enough irritation to slightly increase the blood

supply; at the same time it protects the ulcerated or wounded surface from the action of the atmosphere. (See also under Rosinol).

Rhei Radix— Rhubarb when administered in small doses (2 to 5 grs.) acts as a stomachic, increasing the quantity of the gastric juice, improving the appetite, and assisting digestion, and the tincture has been long used as a tonic. It soon finds its way into the blood, and, acting as a stimulant to the liver, or to that portion of it whose duty it is to secrete bile, it increases the quantity of this fluid without diminishing any of its ingredients, and the cholagogue action of rhubarb is independent of any cathartic action.

In large doses (20 grs.) its cathartic properties are rendered apparent, and it produces mild purgation, probably by stimulating the muscular movements of the intestinal tube from the duodenum to the rectum. It also acts, though to a small extent, as a mild stimulant to the intestinal glands, and slightly increases their secretion. In doses of 60 grs. the intestinal fluids are considerably augmented.

Rhubarb after exercising its cathartic power becomes an astringent, and checks the alimentary secretions, causing subsequent constipation, owing to the rheo-tannic acid which it contains, and consequently it is not an advisable purgative for patients suffering under chronic constipation.

This renders it valuable in *diarrhœa* when we wish to produce an astringent effect after getting rid of some irritating food or matters remaining in the canal.

In *hæmorrhoids* few remedies will be found so useful as rhubarb, and some consider it much more efficacious if slowly chewed in the mouth; but in any case its only disadvantage is its astringency, which is entirely counteracted by two to four dr. doses of olive oil taken every night, floating on a little milk.

The stools are at first darkened, owing to the increased bile and colouring matter of the rhubarb; they afterwards become pale. The colouring matter consists of chrysophanic acid, and is found in the perspiration, milk, and urine, but chiefly in the latter. Hence the administration of the drug has been recommended in *psoriasis*.

An equal quantity of bicarbonate of sodium is said to overcome the astringent properties of rhubarb and disguise its taste; and it may be so ordered as a powder in tea-spoonful doses in water.

It should be ordered with some substance like magnesia, as in the celebrated Gregory's Powder or Pulv. Rhei Co., which may be given in milk, and is an invaluable cathartic in the various *gastric* and *abdominal* troubles of *childhood*. The syrup is well suited for children, the coriander partially concealing the flavour.

The following form will be found a good one for producing

the stomachic effects of rhubarb, though some prefer to substitute peppermint for the spirit of anise; or the official compound powder may be given in a mixture—half an ounce rubbed up with nine and a half ounces of Aqua Menthæ Viridis and half an ounce of Spiritus Ammoniæ Aromaticus :—

℞. *Pulv. Rhei* ℥iss.
Syrupi Simp. ℥j.
Spt. Chloroformi ℥iij.
Spt. Anisi ℥.xxxv.
Aquæ Carui ℥viss. *Misce.*

Fiat mistura. Signa.—"*A small table-spoonful as a tonic or stomachic, or a wine-glassful as a purgative.*"

If a combination of rhubarb with an active cathartic is required, the official pill in 10 gr. doses will be found to answer all purposes.

Rhœados Petala possess very feeble narcotic qualities. Though it is impossible to get any traces of morphine when submitted to chemical examination, still the characteristic effects of opium have been noticed when the syrup has been given to very *young children* or *infants*. Nevertheless, it is only for its colouring properties that it is used.

Ricini Oleum is a mild cathartic, by some authorities classed as a laxative. If rubbed into the skin of the abdomen, injected into a vein, or thrown into the rectum, castor oil is said to produce purging. The intestinal glands are slightly stimulated, and the vermicular contractions are increased in frequency and power, especially in the duodenal part of the canal, the result of which is, that in about six hours several very soft but not watery stools are passed with little pain and no constitutional disturbance. The oil passes out by the bowel; it may be recognised in the secretion of the mammary gland by its purgative effects upon the infant. The seeds are poisonous owing to the presence of a ferment called ricinine, and death occurs without purging. This is not the active principle of castor oil, which is ricinoleic acid existing in the form of a glyceride. The acid is set free by the pancreatic secretion.

The oil possesses no power over the hepatic secretion, and appears to lose its influence after a time; and in some cases its administration seems to be followed, like rhubarb, by an astringent effect. In *pregnancy*, where it is a very safe purgative, large doses may be required if regularly and constantly

employed; and it is strange that sometimes in these cases if the large dose (1 oz.) be withheld, and only one or two tea-spoonfuls given, the drug appears to regain its power, and to purge freely; it has also nutritive virtues.

Its bland qualities render it a favourite and safe purgative for *young children* and *infants*, and in cases of *pelvic disease*. In the *diarrhœa* of infancy it is a prized medicine, acting by safely causing the expulsion of all irritating matters.

In *fæcal accumulations* castor oil has long held a high reputation; but too great stress cannot be laid upon the rule, that it should not be depended upon without the aid of enemata of large quantities of warm water. Accumulations of the rinds of fruits (especially of gooseberries), so often found in children, are not advantageously expelled by castor oil, as is supposed. More energetic cathartics are required, and calomel is especially useful in such cases.

A drop of castor oil allowed to fall upon the *conjunctiva* is a soothing protective when a foreign body has found its way under the lids.

The unpleasant flavour and sickening, greasy taste of castor oil is a great hindrance to its use. If ordered alone, it may be administered when it reaches the sick chamber by floating it upon a little wine or spirit in a glass, after which it should be bolted quickly; some patients take it in orange juice, coffee, water, or gruel.

Directions are frequently given to float the dose between different strata of liquids. This is not practicable. Perhaps the best of all methods is to pour some *thick* cream into a very clean wine-glass, turn it round, so that the sides get smeared well over, pour in a table-spoonful of castor oil, and a little cream on the top. The patient, having taken a tea-spoonful of cream into his mouth and caused it to come into contact with his palate by the movement of his tongue, is directed to swallow at a gulp, the oil and cream out of the wine-glass, throwing back his head, that they may more readily pass over the tongue. Castor oil should be *gently* warmed before being administered, as it is rendered thus more liquid and less adhesive. The essential oil of bitter almonds conceals its nauseous smell.

☞ When the oil is administered very early in the morning (4 to 5 a.m.), the secretions of the mouth are so dried up that often the taste of the drug cannot be recognised.

A favourite combination is a half-ounce dose of castor oil with 10 to 20 minims of tincture of opium to prevent griping.

Children bear large doses well, and a small tea-spoonful is often administered to newly-born infants without producing unpleasant effects. As a rule, never more than half an ounce should be administered for the first time to an adult.

One or two ounces, with as much mucilage of starch, may be injected into the rectum.

Rosæ Gallicæ Petala—The petals of the red-rose possess faint astringent properties, owing to the traces of tannin which they contain.

The infusion made with dilute sulphuric acid and water is an elegant method of administering the mineral acid, and may be made the basis of many agreeable mixtures. Its activity depends upon the tonic and astringent properties of sulphuric acid, and it may be freely given in the *hæmoptysis* and *sweating* of *phthisis*, and as a gargle in *relaxed sore throat*. The dilute nitric acid may be substituted for the sulphuric with advantage in suitable cases as pointed out by Squire.

The confection is used to form the basis of pill masses and cough linctures. The syrup is only used for its colour.

Rosæ Oleum—Otto of rose is only employed for its fragrance, though some believe that in eye-washes and gargles rose-water exercises a soothing influence.

Rosmarini Oleum is a powerful stimulant when taken internally (which is seldom) ; it acts like peppermint.

Externally, it is a valuable rubefacient, and is much used as an application to the *scalp* in *baldness*, where it is commonly supposed to improve the nutrition of the hair-bulbs, by increasing the supply of blood to the skin. Its efficacy is greatly increased by combining it with cantharides. It is often added to liniments on account of its odour.

The following is a valuable remedy for *baldness* :—

℞. *Olei Rosmarini* ʒiv.
Liq. Epispastici ʒii.
Olei Amygdal. Dulc. ʒiss.
Spt. Camphoræ ʒii.
Glycerini Boracis ʒj.
Olei Rosæ gt. viij.
Tinct. Jaborandi ʒi. *Misce.*

Signa.—"*A little to be rubbed into the roots of the hair every night.*"

Saccharum—Sugar as a food possesses well-known properties; it is a nutrient to the adipose tissue of the body and a respiratory fuel. It is used in Pharmacy for a variety of purposes, but the physician only orders it to sweeten mixtures or to assist by its density in the suspension of powders.

Saccharum Lactis is used, owing to the hardness of its particles, to effect the minute sub-division of the particles of substances in powders or pills, and thereby to increase their efficacy and insure their equal distribution in each dose.

It resists fermentation, and is given instead of cane sugar to sweeten the food of *dyspeptic* infants; and for a similar reason it has been given in various *irritable conditions of the stomach*, and as a food in some *wasting pulmonary diseases*.

It has been demonstrated to be a valuable diuretic, enormously increasing the flow of urine in *cardiac dropsy*. It acts as a diuretic in albuminuria, but not so markedly. There is great discrepancy in the doses employed by different observers; these range from 3 drs. to 3 ozs. for a daily dose.

Salicin. (See under Acid. Salicylic., page 314.)

Salol, after administration, is not decomposed in the stomach, but is changed immediately upon entering the bowel, when it comes into contact with the pancreatic juice, which splits it up into salicylic acid and phenol, and it appears at once in the urine as salicyluric acid. Ewald measures the rate at which food passes through the stomach by this means. Salol in large doses causes the urine to become greenish black, and it may produce symptoms of carbolic and salicylic acid poisoning. Nevertheless, it is very much safer than proportionate amounts of these acids, and has been given in 15 to 30 gr. doses in *fevers* without ill effects. After such a dose there may be noticed a drop in the temperature of 5°. It is in *acute rheumatism* that salol has proved a most valuable drug, and its action is allied to salicylic acid in this disease. Innumerable reports testify to its success in acute and chronic rheumatism, *sciatica*, *neuralgia*, and *lumbago*, *cystitis*, *pyelitis*, and *phthisis*, and it possesses analgesic properties like antipyrine, in *migraine*, *ataxy pains*, &c. Its internal use in putrid conditions of the urine is like that of boracic acid, and prevents the necessity of bladder injections or irrigation. It is used as a duodenal and intestinal disinfectant, and as a solvent for gall stones, as it liquefies the bile; it is given also in *catarrh of the bile ducts*, and has been used locally as a mouth-wash, and spray, and application to wounds. 12 grs. may be considered a fair average dose, and it may be repeated every 4 hours; it can be given in tabloids or suspended in water or in wafer-paper. Externally, it can be used exactly like iodoform, and it is maintained by many that it should replace that drug. It contains about 38 per cent. of phenol. Recently, Philippson has reported two cases of *general scleroderma* successfully treated by full doses of salol internally.

(Salol Camphor is a thick liquid prepared by heating together 2 parts of camphor and 3 of salol. It has been used externally

as an antiseptic, and taken internally in small doses. By dissolving 2 drs. salol in 2 drs. ether and 2 ozs. collodion a thick liquid is obtained, which has been painted over the joints in rheumatism with benefit.

Salophen is a body of similar composition to salol; it contains 51 per cent. salicylic acid, and is given in similar doses. It is stated that it is less likely to cause phenol poisoning.)

Sambuci Flores—The water distilled from the flowers does not possess any therapeutic value, though other parts of the plant are by no means inert, for the bark is cathartic and emetic. A decoction of the fresh inner bark is a valuable diuretic, and has been used with success in *acute nephritis*. The water is used as the fragrant basis of lotions, and enjoys the popular reputation of a cosmetic, clearing the skin of marks caused by exposure to sunlight.

Santali Oleum closely resembles copaiba in its action, and is used in the treatment of *gonorrhœa* and *gleet*. It acts upon the lining membrane of the bladder and urethra as it is being excreted in the urine. Posner believes that it has a specific action upon the prostatic portion of the urethra.

If it does not act speedily in 20 minim doses on the gonorrhœal discharge, which it generally diminishes in 60 hours, the probabilities are it will not do much good. The administration of the santal oil should be kept up for some time after every trace of the gleet or gonorrhœa has disappeared. It is excreted by the bronchial surface, and has proved useful in *fetid bronchitis*. It may be ordered with mucilage in a mixture, each ½ oz. of which can be made to contain 20 minims of the oil, with 1 dr. of syrup, 1 dr. mucilage, and 2 drs. infusion of orange It may be given before, after, or with food.

Santoninum is used to destroy worms in the intestinal canal. It is the best vermicide for the common round worms—*(ascarides lumbricoides)*—acting speedily and certainly when properly administered. It also kills the thread-worm, though it appears to have no effect upon the tape-worm.

It kills the worms in doses which do not produce purgation, though it purges if given in large doses, and may cause serious cerebral symptoms. Death has followed the use of the drug in very young children or infants, in whom it sometimes produces convulsions, vertigo, and coma, with purging and vomiting.

Santonin, like many other remedies of its class, produces its effects more certainly if administered after fasting, or after the operation of a mild purge. In castor oil, as pointed out by Kuchenmeister, its acts more satisfactorily than when given in any other way, and the writer can strongly endorse the accuracy of this observation, after seeing its administration in some

thousands of instances in the practice of a children's hospital. Unpleasant symptoms were never observed, though the drug was given in full doses; *the oil appears to lessen very considerably the risk of any evil effects*. To a child two years old 2 grs. may be given at bed-time, mixed with a large tea-spoonful of castor oil, and more oil or other purgative administered in the morning if necessary. The worm is generally expelled dead, and it has been stated that the drug acts by causing convulsive movement in the worms which excites the intestine to expel them.

Some curious effects follow the use of santonin. Yellow vision may be noticed inside an hour after administration; every object appears yellow or green to the patient, and violet objects are recognised with difficulty, though the humours or solid tissues of the eye are not in any way coloured. The effects appear to depend upon the action of santonin on the delicate retinal fibres. The retinal blood vessels are always congested. Perversions or alterations in the smell and taste are also occasionally experienced. The urine is very often stained yellow, orange, or red, apparently varying in colour according to the degree of its alkalinity; and santonin acts as a diuretic, stimulating the kidneys, by which it is eliminated, and it also sometimes renders the bladder irritable. It is supposed to act in the blood in combination with soda. It has been tried unsuccessfully in *nocturnal incontinence of urine*, in *amaurosis*, and for *colour-blindness*. It has been said to remove the discharge in *gleet*, and to diminish slightly the albumen in *albuminuria*, Chéron lauds it in *dysmenorrhœa* and *amenorrhœa*. When given to *young* animals santonin produces cataract.

It may be given in the form of a lozenge or as a powder, with a little calomel, or in olive oil, to those who cannot bear the taste of castor oil; or it may be given in a suppository.

It may be dusted in fine powder over a slice of bread and butter, and is thus readily eaten by children.

(For a child 2 years old.)

R. *Pulv. Santonini* *gr.* ii.
Pulv. Sacchar. Alb. *gr.* ii. *Misce.*

H. S. S. ex cochlear. i. *parv. Ol. Ricini.*

For Santoninoxim, the non-poisonous substitute for santonin, see the Non-Official Remedies.

Sapo Animalis, Durus, and Mollis are introduced into the B.P. as excipients for pill masses, and as vehicles for liniments and plasters.

Soap, however, possesses other valuable qualities. Thus, it is an antacid, and, acting like the alkalies, will counteract an excess of acid in the system, and this, too, in a way which cannot so

readily be achieved by the soluble alkalies. It can be so easily given in the pilular form that we can manage to have its alkaline effect produced at that part of the canal which the more soluble alkalies generally do not reach. It may act as a restorative by supplying to the bile some salts which are natural constituents of that fluid. At the same time it may assist in the emulsifying process going on in the duodenum, and, added to purgatives like aloes and jalap, it mitigates their acrimony, and at the same time quickens their operation; and this is frequently explained by pointing out the *solvent* power of soap over these bodies. Large doses of soap have been recommended as a solvent for *gall-stones*, and as a means of rendering the urine alkaline in cases of *renal calculi*.

It acts as a laxative when swallowed or introduced into the rectum, and this latter action of soap affords one of the most simple and convenient methods of emptying the lower bowel. In the case of infants, a thin, wedge-shaped piece of ordinary hard soap may be introduced through the anus for an inch or more, and held there for a few moments. By its irritation, reflex action is aroused, causing the contraction of the rectum and often of the entire colon. In adults, a small plug as large as the last joint of the index finger may be inserted like a suppository, and allowed to remain till expelled.

Externally, the cleansing properties of soap are well known; and it should be remembered that it often irritates *eczema* and prevents its cure, whilst sometimes, in sluggish cases, it may act as a healthy stimulant. By far the least irritating soaps made are the superfatted soaps like vinolia.

The liniment of soap is a valuable remedy in *sprains*, *bruises*, and *stiffness* of *joints* from inflammatory effusion; its action in such cases is called "discutient." It removes the swelling by stimulating the absorbents, and requires friction in its application. The plaster is supposed to act in the same way, but it probably possesses no specific action beyond the support and pressure which it affords, at the same time giving the affected surface somewhat of the benefits of an internal part.

Sarsæ Radix—About this drug very different opinions prevail, some authorities condemning it as absolutely inert, while many surgeons firmly believe in its virtues as a diuretic, diaphoretic, and antisyphilitic. It is probable that the *fresh* root possesses properties which render it of value in the treatment of *secondary* and *tertiary syphilitic affections*, various *skin diseases*, &c.

The dried root produces no appreciable therapeutic effects. The compound liquor may prove of some value, as there are three ingredients contained in it which possess well recognised tonic and diaphoretic properties.

Sassafras Radix is generally classed as a stimulant and diaphoretic; the oil produces the effects of a mild stimulant, acting upon the vascular and nervous systems.

The drug is often employed for its flavour, and it gives diaphoretic qualities to the compound liquor of sarsaparilla.

Scammonium and its resin resemble jalap very closely in their action. They are powerful hydragogue purgatives, producing their effects by their *local* irritative action on the bowel, causing in about four hours the evacuation of the contents of the colon in a semi-solid form, soon followed, with much griping, by liquid stools. Five grains of the resin, or ten of the gum-resin or scammony, are a fair dose for an adult; but this drug should be given in combination with some purgative which would assist its action and diminish the griping. The best way to achieve this object is to combine it with calomel.

It is indicated where the thorough evacuation of the contents of the bowel is desired, as in *impaction of fæces*, or where a quantity of serous fluid is required to be removed from the blood, as in *head injuries* and *dropsies*.

It appears to act more promptly when given with an alkali, and soap answers this purpose well; the drug does not act in the absence of bile, and it is the soda of this secretion which assists its action; sulphate of potassium corrects its griping.

Though a powerful stimulant to the intestinal glands, it has but a very feeble effect upon the liver.

Scammony has been much used as a remedy for the various forms of *parasites* infesting the alimentary canal, especially of children. There is, however, no evidence to show that it acts as a true anthelmintic, since its beneficial results in such cases appear to be easily explained by its irritant purgative qualities.

℞. *Scammoniæ Resinæ gr.* x.
Hydrarg. Subchloridi gr. vj. *Misce,*
et divide in pulv. ii. *st.* i. *statim.*

Scilla—Squill is a violent irritant poison, causing death by its action upon the gastro-intestinal mucous membrane, giving rise to vomiting and purging and severe inflammation of the mucous tract. These effects are noticed in a more or less marked degree, whether the drug be swallowed, applied to the broken skin, injected into a vein or into a serous cavity, or under the skin. In its action it closely resembles digitalis, but it is more irritating to the stomach and bowels, and it has valuable expectorant powers which digitalis has not. It is excreted by three outlets—by the bowel, acting as a mild purgative; by the kidneys, which it stimulates, producing diuretic

effects ; and by the pulmonary mucous membrane, whose secretion it liquefies, thus acting as an expectorant. It is for this last effect that squill is ordered most frequently, and it may be well combined with ipecac. The syrup and the oxymel possess reliable expectorant powers in the *chronic bronchial affections of childhood* and *infancy*, in 10 minim doses. It is rarely used alone as a diuretic, but is generally given with digitalis and mercury. (See page 381).

Its use is indicated in *chronic catarrhal affections* with profuse *tough* expectoration, and in *dropsies*, in the absence of any inflammatory state of the stomach, bowel, or kidneys. It is especially useful in *cardiac dropsy*.

(As an Emetic for a Child one year old).

℞. *Syrupi Scillæ*
Vini Ipecac. ana ℥j. *Misce.*
St. ℥i. *omni semi-hora ad effectum.*

20 drops may be given every 3 hours as an expectorant.

The active principles Scillain and Scillipicrin are powerful cardiac poisons.

Scoparii Cacumina—Broom is a valuable and safe diuretic, resembling buchu and digitalis. In large doses it is an irritant to the gastro-intestinal mucous membrane, producing vomiting and purging, though only to a slight degree. It is given in cardiac and chronic renal dropsies, where no active inflammation of the kidney is present. Sparteine, the active principle of broom, has been recently found to possess properties of a cardiac tonic nature, like digitalis. (See Sparteine in the Non-official Remedies).

℞. *Succi Scoparii ad* ℥iv.
Tinct. Digitalis ℥iv.
Spt. Æther. Nitrosi ℥vj. *Misce.*

Fiat mistura, capiat ℥i. *sextis horis.*

Senegæ Radix is one of the most frequently used expectorants acting upon the bronchial mucous membrane, over which it exercises a stimulating influence. It is given in *chronic bronchitis* and *emphysema* when there is *profuse* adhesive discharge. Some authorities explain its effects as depending upon a stimulating action on the respiratory centre or efferent nerves, which causes continual coughing, thus keeping the tubes clear and preventing the accumulation of mucus. Farquharson believes that it acts

as a tonic to the muscular tissue in the bronchial tubes, thereby facilitating the expulsion of their contents. Its action is greatly increased by carbonate of ammonium.

It causes a warm acrid sensation when chewed, and increases the salivary secretion; in large doses it is an emetic, and may cause purging. It does not increase the amount of urine in health, but, like digitalis, it augments it in diseased conditions of the kidneys or heart.

The tincture emulsifies fats and oils in quantities so small that its medicinal action may be left out of consideration; thus, three minims will emulsify half an ounce of fixed oil.

The following is one of the most popular combinations for chronic bronchitis:—

℞. *Infusi Senegæ* ℥vii.
Tinct. Senegæ ℥ss.
Tinct. Camph. Co. ℥ss.
Ammon. Carb. ʒiss. *Misce.*

Fiat mistura, capiat cochleare magnum quartis horis.

Senna is a valuable purgative, containing, like rhubarb, cathartic and chrysophanic acids. Entering the blood, it produces its effect upon the bowel, and it has been supposed to act in the same manner whether administered by the mouth or injected into a vein. Stockman, however, injected poisonous doses without producing any results. The small intestines are stimulated by it, and both their secretion and movements are increased; it produces thin but not watery motions, generally accompanied by considerable griping pain. Senna, when administered to nursing mothers, appears in the milk, where, according to Dolan, "its peculiar flavour and odour are distinctly perceptible, though it does not lessen or increase the secretion of milk." It invariably gripes the infant.

Senna should be combined with aromatics to correct the griping, and the compound mixture is a valuable method of administering the sulphate of magnesium. Senna is said to be a chief ingredient in Tamar Indien, which is a valuable purgative.

It is a safe *purgative* for *children;* though causing pain, ill effects are rarely seen to follow large doses.

In *dyspepsia* and *obstinate constipation* the infusion in a wine-glassful dose, to which a table-spoonful of the tincture is added, makes a powerful purgative. It acts, according to the experiments of Rutherford, slightly as a stimulant to the liver.

The syrup is an elegant, though very uncertain purgative for young children, and it may be used as the vehicle for almost any

medicine ordered as a powder. 2 grs. of grey powder given in a tea-spoonful of syrup of senna is a very palatable purgative and cholagogue.

The confection is a mild and safe laxative, suitable in most cases of *chronic constipation* when given in tea-spoonful doses.

The compound powder of liquorice owes its purgatives virtues to senna, and is a safe, palatable, and efficient cathartic suitable for children and adults.

St. Germain's Tea—*i.e.*, 30 grs. Senna leaves, 15 grs. Elder flowers and Anise fruits, with 8 grs. Cream of Tartar and Fennel fruits, infused in a cup of boiling water, is an elegant and palatable method of giving senna.

Serpentariæ Rhizoma—Snake-root is a doubtful tonic, possessing feeble aromatic properties. Small doses increase the appetite and promote digestion by mildly *stimulating* the mucous membrane of the stomach. Large doses produce irritation in the stomach and bowel, as evidenced by nausea and diarrhœa.

It is employed in *dyspepsia* arising from want of tone, or atrophy of the gastric tubules, and its supposed stimulating properties have obtained for it some repute in low febrile conditions, as in *typhus*, *typhoid*, *diphtheria*, and *rheumatism*. It is supposed to act in *gout* like guaiacum.

Snake-root does not, as once believed, possess any value in the treatment of *rabies* or *snake-bites*, nor is there any evidence of its emmenagogue or diuretic properties, and it is to be regretted that this comparatively worthless drug is still retained in the B.P., where it has got several preparations.

Sevum Præparatum—Suet is a well-known fat and a nutritious article of diet, but it is introduced into the Pharmacopœia solely for its physical qualities.

Sinapis—Mustard is rarely prescribed internally, except as an emetic in cases of poisoning, when a table-spoonful, stirred up in a tumblerful of warm water, may be administered, and warm water freely swallowed afterwards. As a condiment it is supposed to increase the appetite, though the gastric juice is not markedly increased by its local action.

Externally, mustard is the best counter-irritant for general purposes ; it differs from cantharides in the rapidity and amount of pain attending its action. When applied to the skin, mustard quickly causes a flow of blood to the vessels of the part, and if its application be continued too long, inflammation of the skin, vesication, or ulceration may follow.

The plaster is spread on a variety of fabrics, and covered with tissue paper, muslin, cambric, &c., but every requirement is met by the following rapid, cheap, and convenient plan :—

The required quantity of mustard is put into a large cup (about a table-spoonful of mustard makes a fair-sized sinapism) and as much *cold* water is poured upon it as will make a soft uniform cream, not quite so fluid as to flow or pour readily out. A sheet of paper is procured of such thickness as will readily permit the fluid part of the cream to soak through it, without becoming too easily torn. Old newspaper is the best texture for this purpose, and it should be laid out upon a table or smooth surface, the mustard cream turned out of the cup, and roughly smeared or spread over its centre. The circumferential or clean parts of the paper are folded over this, making the required shape and size of the sinapism, which is lifted off the table, and the surface which was undermost applied direct to the patient's skin. Less than a minute is enough (when the materials are at hand) to perform this little operation.

It will be observed that the mustard does not thus come in contact with the skin, but only its moisture, which soaks through, the paper being between the skin and the cream. The sinapism should be kept in contact with the patient's body by a bandage or pad of flannel for 15 to 30 minutes. In the case of children, the mustard before being moistened, should be mixed with from 1 to 4 parts of wheaten or corn flour to dilute it. Often the question is asked the young practitioner, How long should such an application be permitted to remain? This is difficult to answer, and he should direct that, after a few minutes the edge of the sinapism be raised and the redness of the skin noticed. If it remains scarlet for a few minutes the application should be removed, but if the redness is only temporary the sinapism should be kept on longer.

A mistake is made in directing the surface to be immediately covered with cotton-wool, greased linen, &c.; it should first be always wiped dry and clean with a very soft rag; otherwise as much acrid moisture may be left on it as may produce vesication and dangerous ulceration in the delicate skin of an infant.

The mustard bath is a favourite method of applying counter-irritation—to the feet for *headache;* to the abdomen for *amenorrhœa,* at the time of the expected period; or to the loins in *suppression of urine.* About 2 ozs. of powdered mustard seeds to 10 gallons of hot water (102°) will make an agreeable bath. In a similar way it may be used as a *hot pack* in *rheumatism,* &c. (See under Aqua).

Pain of various kinds is relieved by the application of a sinapism; but, as a rule, it is aggravated if it be placed directly over the pained nerve. It should, as a general rule, be applied over the site of its origin near the spine.

Headache is often relieved by a sinapism applied over the

nape of the neck, and *vomiting* stopped when it is put over the epigastrium.

The action of mustard when placed over the seat of *internal inflammations*, or over the chest and legs in case of *stupor*, is to be explained on the theory of reflex action. It is easy to see that the impression produced by an irritant on the peripheral endings of any nerve may be conducted to the nerve centre or brain, and from thence may be reflected to any other part of the nervous system; thus a sinapism on the chest may stimulate the respiratory or cardiac centres. (See under Cantharis.)

Sodium—The salts of sodium possess such close resemblance in their pharmaceutical, chemical, and therapeutical properties to those of potassium, that only a brief enumeration of them is necessary. Speaking generally, sodium salts differ in the following respects from the corresponding potassium compounds—(1) they are less caustic when used externally; (2) they *exert scarcely any depressing influence over the heart*, and hence are not poisonous in the sense that potassium salts are; (3) they are less diuretic; (4) they form less soluble salts with uric acid; (5) owing to the entire system being saturated with sodium, medicinal doses do not appreciably affect metabolism (Mitchell Bruce); and (6) they are much less diffusible.

Soda Tartarata—Rochelle salt closely resembles the tartrate of potassium, though its diuretic powers in ½ to 1 oz. doses are so feeble that they are doubted by some. It is a very popular saline purgative, acting as a strong stimulant to the intestinal glands. Small doses have the power of rendering the urine alkaline like the potassium salts, though not so certainly.

Its cathartic action is most unreliable unless given in a full dose, so that it is a good rule to give at least six drs. Often four drs. may be administered and *no effect whatever* be noticed, while five or six drs. may purge freely. The B.P. *maximum* dose (240 grs.) is quite too small.

1 oz. Rochelle salt dissolved in a glassful of aerated lemonade or ginger ale makes a pleasant saline purgative; or it may be taken in the form of Seidlitz powder.

Sodæ Chlorinatæ Liquor—The hypochlorite of sodium contained in this liquor is readily decomposed when it comes in contact with the weak acid compounds of the body.

The hypochlorous acid, which is given off in contact with any acid, is a powerful oxidising agent, giving off its active oxygen, which greedily attacks most animal substances, whilst its chlorine enters into combination with the hydrogen of many bodies. This solution is a strong disinfectant and antiseptic. It is also regarded as a stimulant. These varied qualities render it of

use in low *typhoid conditions* and *adynamic fevers*, especially in *diphtheria* and *malignant scarlatina*.

It should be given alone with water—1 scruple mixed with 1 oz. every two or four hours.

Externally, it is an invaluable remedy as a gargle in *putrid throat affections*, in which case it may be made of the same strength as for internal use. (See Calx Chlorinata.)

Sodii Arsenas is really an arsenical preparation. (See under Acid. Arsenios.)

Sodii Benzoas is identical in action with Acid. Benzoic. (which see). It is used for its diuretic and antiseptic qualities in *renal* and *bladder diseases*, being excreted as hippuric acid after uniting in the kidneys with glycocoll. It has been given in *diphtheria*, *phthisis*, *rheumatic fever*, *uræmia*, and *gout*.

Sodii Bicarbonas closely resembles the bicarbonate of potassium (which see). Like it, it is antacid, and though less irritating, it possesses greater saturating power. It has also a more soothing effect upon the stomach than the corresponding potassium salt, but it is very inferior to it as an antilithic, since the salts which it forms with uric acid are only slightly soluble. This is seen in *gout* in the deposit which forms about the joints, which consists of urate of sodium. It does harm in cases where there are phosphatic sediments in the urine. To neutralise *gastric hyperacidity*, the drug may be used in 30 to 60 gr. doses with great benefit, and even for long periods.

In the form of Vichy water the bicarbonate of sodium has been long in use as a remedy for many complaints supposed to be of *gouty* origin, and has been found to relieve *frontal headache*.

Externally, the bicarbonate of sodium has been found to possess an almost magical power when applied to painful *burns* and *scalds*. If used *immediately* after contact with great heat, what would otherwise be a painfully blistered spot is entirely relieved, and often in a few hours may be found to differ in no way from the healthy surrounding skin. It may be applied in solution of any strength, and the salt made into a paste with water and rapidly applied to the injured part generally produces surprising results if vesication has not already occurred.

It is strongly recommended in *acute tonsillitis* as a gargle, or brushed over the swollen glands.

It is used in a variety of *cutaneous affections*, and 1 oz. in a pint of water, sponged over the itching skin in *urticaria* and other complaints, often gives relief; it may be combined in these cases with Prussic acid. It relieves the pain of *wasp stings*, but is inferior to ammonia in this respect.

Sodii Bromidum acts like the bromide of potassium—(page 341)—only it is less irritating to the stomach and less depressing upon the heart, and should always be preferred in *epilepsy*.

Sodii Carbonas resembles the bicarbonate, but is more caustic and more soluble. It makes a very good effervescing mixture when given with lemon juice, superior, indeed, in its sedative effect upon the stomach to any other combination, and with it hydrocyanic acid can be given. The dried carbonate of sodium is the most convenient antacid to give in pill or powder; it is nearly three times stronger than the crystallised salt.

℞. *Sodii Carbonatis* ℥vj.
Acidi Hydrocyanici Dil. ♏. xxx.
Aquæ Destillatæ ℥x. *Misce.*

Fiat mistura, cujus cpt. ℥i. *cum* ℥ss. *succi limonis recentis tertiis horis.*

The alkaline bath is made by dissolving 8 ozs. of carbonate of sodium in a large bathful of water—say about 60 gallons.

Sodii Chloridum enters so largely into every tissue of the body that life cannot be sustained when it is withheld. It is absolutely necessary wherever cell growth is rapidly going on; animals would soon die without it, especially growing animals. Small doses are restorative and tonic; large doses (1 to 2 ozs.) are either slightly purgative or emetic.

It possesses expectorant qualities if given in 1 dr. doses—every two or four hours. It is excreted by the mucous membranes of the body. It is a certain antiseptic, and destroys the small thread worm, *ascaris vermicularis*, when administered by the rectum (½ oz. in 3 or 4 ozs. of water).

1 lb. of salt and 3 gallons of water make a convenient substitute for sea-water. The brine baths of Droitwitch owe their virtues chiefly to this soda salt; they are of great value in *chronic rheumatism and joint diseases*.

It is used sometimes (1 to 30) as a gargle in *chronic catarrhal throat affections*, and is a valuable antidote in cases of *poisoning with nitrate of silver*, or after swallowing a *leech*. Wyman applies the dried salt mixed with three times as much elm bark and a little hyoscyamus to the os uteri in *subinvolution*, and retains it in situ with cotton-wool. It depletes like glycerin.

Betz has used chloride of sodium in *internal hæmorrhages* with marked benefit. He dissolves a tea-spoonful in half a litre of water, and administers it by the mouth at the rate of three table-spoonfuls every five minutes. Since Nothnagel pointed out

the good results of common salt in *epiepsy* various observers have reported cures. 1 dr. doses may be given. In a similar way *migraine* is sometimes relieved.

The *hypodermic* injection of an 8·75 per cent. solution of salt into the subcutaneous cellular tissue has been advised in *cholera*, and in doses of 5 to 40 ozs. it has often saved life in *uræmia*, *eclampsia*, *sepsis*, &c. The writer has injected by the aspirator needle 120 grs. of salt, dissolved in 40 ozs. sterilised water, selecting the thighs, abdomen, buttocks, and back in many instances without the least untoward results. Weak solutions (1 drachm to 1 pint) have been injected into the veins in *acute anæmia* from hæmorrhages of all kinds and in *diabetic coma*.

Sodii Citro-Tartras Effervescens—This agreeable antacid and purgative is the official representative of the popular "Granular Citrate of Magnesia," only the latter usually contains some Epsom salt. It may be taken in table-spoonful doses, dissolved in a large quantity of water, as it seldom affects the bowel unless freely diluted.

Sodii Ethylatis Liquor is a valuable caustic, powerful and almost painless; it is antiseptic. Brushed over *lupoid growths* and small *nævi*, it causes their obliteration with very little deformity. It should be applied occasionally with a glass brush or camel's hair pencil till a scab forms, and then its application should be withheld for a few days till the scab or destroyed cuticle falls of, when it may be re-applied. If pain results, a drop of chloroform, which converts the ethylate into ether and chloride of sodium, may be laid upon the part.

Sodii Hypophosphis resembles in its action the lime salt of the same name. It has been erroneously supposed to give all the benefits of free phosphorus without any of its drawbacks, but the evidence of its usefulness in *scrofula* and *phthisis* is regarded by several authorities as somewhat doubtful.

Sodii Iodidum resembles closely the iodide of potassium, and can be tolerated by the stomach in larger doses, and could be substituted for it on all occasions with benefit.

Sodii Nitris has been found to possess similar properties to nitroglycerin and nitrite of amyl; thus, within 10 to 15 minutes after a dose of 5 grs. there follow flushing of the face, throbbing of the head, increased frequency of the pulse, lowering of the arterial pressure, &c. Dr. Hay has tried nitrite of sodium in *angina* with the most satisfactory results. He has closely studied its chemical action alongside nitrite of amyl and glonoin, and believes that they all owe their activity to the nitrous acid contained in them. (Page 480.)

There appears to be a decided advantage in favour of nitrite of sodium over the amyl salt in the duration of its influence, but it has the corresponding disadvantage of being slower in giving relief unless taken *before* the attack. It is used with good results in the increased arterial tension of *granular kidney disease*, especially when associated with a weakened and dilated heart. It has also been sometimes employed with marked effect in aortic disease, and acts somewhat like digitalis.

It does not cause so much throbbing and headache as Murrell's remedy—nitroglycerin. Lublinski has employed it in *hemicrania* and in *asthmatic complaints* of purely bronchial and neurotic origin with marked success.

Dose—1 gr. will be found quite sufficient to begin with, and rarely will 3 grs. be required. It can be given in solution in water.

☞ The difficulty always experienced in exhibiting the nitrites in *angina* is to keep up the action as continuously as possible; the method adopted by the writer (page 480) meets this difficulty.

Sodii Phosphas is a most valuable saline purgative, and can be safely used when most purgatives are contra-indicated—in serious cases of *enteric fever* with bowel complication. It can, owing to its freedom from unpleasant taste, be given instead of common salt in beef tea or soup. This is a most satisfactory plan of giving a mild cathartic in *fevers;* half an ounce often will be found enough, but three times this quantity may be administered; the effervescing preparation may be tried. It is also recommended in small doses for the qualities which it possesses in common with all the sodium and potassium salts—antacid, diuretic, antilithic, &c.

Sodii Salicylas. (See under Acid. Salicylic., page 314).

Sodii Sulphas—Glauber's salt is chiefly used in veterinary practice, though, by its stimulating effect upon the glandular intestinal apparatus, it is a safe and certain purgative. The experiments of Rutherford also prove that it is a moderately powerful stimulant to the liver, and it has been given in 1 dr. doses in *biliary calculi.* (See under Magnesii Sulphas). The effervescing preparation is a great improvement. Reverdin recently affirms that sodium sulphate in 2 gr. doses every hour increases the coagulability of the blood, and is a splendid method of treating hæmorrhages.

Sodii Sulphis is a weak antiseptic, preventing fermentation, like sulphurous acid. It is given in 20 gr. doses in various *stomach* affections characterised by the presence of sarcinæ and torulæ, and, in solution, has been used externally in various parasitic skin diseases. The hyposulphite in drachm doses has been found valuable in gangrene of the lung.

Sodii Sulphocarbolas possesses the antiseptic and antipyretic qualities of carbolic acid. It has been given in *fermentative states of the stomach*, *cholera*, *diphtheria*, *scarlatina*, and all the *fevers*, and in various *septic* conditions, as in *ulcerative endocarditis*, where Sansom praises it strongly.

Spiritus Rectificatus and Vini Gallici. (See under Alcohol, page 319).

Staphisagriæ Semina contain at least two alkaloids—Staphisagrine and Delphinine. The former is a powerful respiratory poison like curara. Delphinine acts like aconite, and when applied over painful cutaneous nerves causes numbness and tingling, and diminishes pain like veratrine. It has been used as an ointment (20 grs. to 1 oz.) in *neuralgia*. Internally it slows the pulse like aconite, and diminishes the number of respirations, causing death by asphyxia with spinal paralysis. It has been given in *asthma*, *rheumatism*, *neuralgia*, and *dropsies*.

Stavesacre seeds are, however, introduced into the B.P. on account of the satisfactory power which their ointment possesses over the parasite that frequents the hair of the head. The official ointment destroys pediculi with safety. Formerly the seeds were given internally as an emetic and vermifuge, but their use is now restricted to their antiparasitic action.

Stramonium possesses properties identical with belladonna, and yields an alkaloid, Daturine, identical with hyoscyamine and isomeric with atropine. The leaves of the plant have been long used as a remedy when smoked alone or mixed with tobacco for *spasmodic* bronchial affections, chiefly *asthma*. Sawyer recommends the inhalation of the fumes produced by burning a powder consisting of 1 oz. of the powdered leaves, ½ oz. powdered anise fruit, and ½ oz. nitre. This somewhat resembles, in composition, Himrod's and Girdwood's asthma cures. The extract made from the seeds should not be given in doses larger than ½ to 1 gr.; it sometimes prevents the asthmatic attacks when given a few hours before the expected seizure.

Stramonium belongs to a natural group, called from their action, by Headland—Deliriants. The group contains Belladonna, Hyoscyamus, Stramonium, and Datura Tatula. (See Datura amongst the Non-Official Remedies.)

Strophanthus—Fraser first called attention to the effects of this remedy upon the heart. It is a powerful muscle poison, stimulating all striated muscles and finally arresting the heart in systole. It very closely resembles digitalis, though it is more powerful, and its effects upon the circulation are produced mainly by its action upon the heart, as it has only slight influence in causing contraction of the arterioles.

It is diuretic, but not to the same extent as digitalis, and it is also said to be antipyretic. In every form of cardiac weakness, either arising from functional excitement, valvular disease, degenerative changes, or secondary to renal affections, this remedy has established for itself a reputation only second to digitalis, and in some respects it has the advantage of that drug, as it can be given in those cases which one constantly meets with where digitalis cannot be tolerated, and the writer has noticed that this oftener occurs in mitral obstruction, with a very narrow orifice. It does not accumulate in the system, and it produces less digestive disturbance, and if its effects pass off more quickly they are certainly more rapid in their appearance, and it appears to have some sedative action on the cerebrum and medulla. Moreover, strophanthus is invaluable as a remedy to be given in the intervals, when it is found wise to suspend digitalis, and in those cases where the latter drug causes trouble by its effects upon the capillaries. It will be found a wise and often highly satisfactory plan to give digitalis for two months, and then strophanthus, combined with Easton's syrup, for one month, in ordinary cases of failing compensation. The reports of the drug differ much in detail, and this arises from the difference in strength of the preparations used and of the seeds imported. D.-Beaumetz gives large doses, and affirms that the tincture is diuretic, but that strophanthin is not. (See under Ouabain in the Non-Official Remedies). The writer has obtained good results from the drug in *exophthalmic goitre*. The new B.P. tincture is made so weak that it has the same dose as the tincture of digitalis.

Strychnina. (See Nux Vomica.)

Styrax Præparatus—This balsam resembles those of Peru and Tolu in its action, being a feeble, stimulating expectorant. It possesses some tonic influence over the genito-urinary mucous membrane, and has been used in *gonorrhœa*. 20 grs. may be given, made into a bolus with liquorice.

Mixed with twice its bulk of olive oil it is efficacious in *scabies*, but albuminuria has been noticed after its application.

Sulphonal is the type of a pure hypnotic, and possesses no analgesic properties. In small doses it possesses the remarkable power of checking or preventing the night *sweats of phthisis*.

In cases of simple *insomnia* uncomplicated with pain it acts with much certainty, and is altogether free from the objectionable qualities possessed by chloral. Thus experience has proved that no sulphonal habit has been observed, and though it appears to have *slight* and insignificant cumulative action, there is no necessity for increasing the dose. Sleep does not come on immediately, sulphonal being very slow in its action, and some-

times three or four hours elapse before the soporific effect begins to manifest itself. Leech has drawn attention to the prolonged deferred action of sulphonal, which sometimes causes a drowsiness, which may last for a considerable part of the day following its administration. This is more liable to happen when it has failed to induce sound refreshing sleep after the usual interval. This drowsiness often extends into the following night, and some patients find that it produces better effects upon the second night without taking any more of the drug in the meantime. Hence the writer only gives sulphonal in full doses every alternate night in simple insomnia. There is no depressent cardiac action, and the respiration and arterioles are not influenced. The only untoward effects worth mentioning are those which occasionally have been observed in the nervous system. Restlessness, hallucinations, vertigo, giddiness, and confusion of thought, have sometimes, though rarely, been noticed to take the place of sleep.

Ataxia with staggering gait occasionally follows the use of the drug, and after full doses the inco-ordination has appeared to resemble drunkenness.

Thirty grains should be given from 1—3 hours before retiring to rest. If a moderate dose of very hot whiskey punch be selected as the vehicle the most unobjectionable and certain hypnotic combination will be obtained. When the alcohol is combined with it, the dose should be given as the patient retires to bed, as when given in solution its effects are rapid.

The writer generally gives it in fine powder, made up as a sandwich between two pieces of thin bread and butter, or dropped dry upon the tongue and washed down by a draught of water.

It may be given in the sleeplessness of every disease where pain is absent, and it is, upon the whole, the best remedy for simple *insomnia*. In *insanity*, however, it is inferior to paraldehyde and hyoscine, in the opinion of those best calculated to judge, and in all depressed states of the mind its action is less certain. It is the best soporific for children.

Sulphur when administered in a full dose (say 2 drachms) passes unaltered through the stomach, and meeting the alkaline bile, a small quantity is absorbed after its solution in that fluid. This quantity, after circulating through the blood as an alkaline sulphide, is excreted by the skin in the form of sulphuretted hydrogen, staining any metallic substances with which it comes in contact. Some of it is also excreted by the kidneys as sulphates, and some passes off by the respiratory mucous membrane, which it stimulates. Of the surplus in the intestine a small quantity is converted into sulphides by the bile, and acts as a mild irritant (just as sulphide of calcium would do, if administered); this causes slight purgation, producing large, softened motions. The

residue, which constitutes the greater part of the dose, acts by the angularity of its gritty particles the part of an irritant, like bran, &c., and increases slightly the peristaltic movement of the bowel, and thus aids purgation. This seems to be the most probable explanation of the internal action of sulphur in full doses. Since it exists in large quantities in the bile, sulphur will act as a restorative in some conditions of the system characterised by a deficiency of that fluid. Buchheim found that when sublimed sulphur was administered 15 per cent. of it appeared in the urine as sulphuric acid, but when the milk of sulphur was taken 46 per cent. appeared.

Its purgative action renders it very useful in the treatment of *hæmorrhoids*, and Neligan believed that in addition to its effect as a cathartic in this complaint, it exercises a beneficial soothing influence over the *hæmorrhoidal* vessels, whereby their calibre is diminished and the symptoms ameliorated.

It has been used as a purgative in *skin diseases*, but it often aggravates if there be active cutaneous inflammation.

Sulphur is an expectorant, probably stimulating as it passes out the mucous epithelial cells of the respiratory passages, with their cilia.

Sulphur is best administered in marmalade thus:—Sulph. Præcip. ℥iss.; Conservæ Aurantii (Keiller) ℥viii.

All the virtues of sulphur are found in a vegetable containing it in considerable quantity (the onion), and it will be found for every purpose the most satisfactory form for the administration of the drug. The Spanish onion, boiled for one or two hours, and eaten freely at bed-time, is a certain purgative, and possesses most decided expectorant qualities. In cases of *chronic catarrh* of the larger *respiratory tubes*, it is more efficacious than any official expectorant, probably because it contains a volatile principle in addition to the sulphur.

Sulphur has been praised as an external and internal remedy in *chronic rheumatism*, and forms a principal ingredient in the "Chelsea Pensioner." (Page 391). Valuable results are obtained in *sciatica* by carefully bandaging the entire limb in flannel after being freely rubbed and sprinkled over with a thick layer of sulphur. In these cases the drug rapidly finds its way into the system.

The sulphides have been highly commended in various *suppurative skin affections* — as *boils* and *acne;* the onion treatment has proved much more satisfactory in the writer's hands than sulphide of calcium, which is occasionally uncertain and intolerable.

Externally, sulphur is the best treatment for the *itch;* a thorough application of the official ointment to the skin, after a hot bath and good scrubbing with soap to break up the burrows

of the insect, generally proves efficacious. The pentasulphide of calcium, prepared by boiling 4 ozs. of powdered sulphur with an equal quantity of lime-putty, or slaked lime, in 40 ozs. of water, is a more certain and elegant application, known as Vlemingkx's Solution. It should be lightly brushed or sponged over the affected part. It appears to act by instantly giving off sulphuretted hydrogen on coming in contact with organic matter, this gas destroying the insect. It is free from the objectionable greasiness of the ointment, and is less irritating, since no previous scrubbing or soaping is necessary.

Sulphur has been used as a local application to the false membrane in *diphtheria*, either as a gargle or insufflation, as it comes in contact with the mucous membrane H_2S is freely given off.

The treatment of phthisis by rectal injections of sulphuretted hydrogen has almost passed into disuse.

The ointment is recommended in *acne*, and often does good when well rubbed into the indurated spots. The precipitated sulphur in a lotion is an unobjectionable way to use this remedy for *acne*.

℞ *Sulphur. Præcipitat.* ℥ij.
Glycerini ℥j.
Aquæ Rosæ ad ℥viij. *Misce.*

Fiat lotio. Applic. mane nocteque.

Potassa Sulphurata acts like sulphur when given in very small doses; in large doses it is an irritant poison, and produces narcotic symptoms and convulsions. It is recommended in 2 grain doses in various chronic *skin* diseases. (See Calx Sulphurata.) Externally, it is used as a bath (5 ozs. to a large bath of warm water) in *scabies*.

Sulphuris Iodidum—This remedy possesses some of the properties of the two substances entering into its name. It is principally used externally as a remedy in *parasitic diseases* and occasionally in *acne* and *scrofulous affections*. From experience of the writer in an agricultural district where *herpes circinatus* was exceedingly common (being transmitted to the human species from the cow), this remedy was found more certain than any other, scarcely ever failing to entirely remove all traces of the parasite when applied a few times to the diseased spots. It is, however, liable to produce irritation of the skin, but this greatly depends upon the method of its preparation, the official ointment requires great care and laborious trituration, otherwise the hard, gritty iodide is left in little masses, which produce local inflammation of the skin.

Sumbul—This root is supposed to possess nervine tonic properties closely resembling valerian and musk, and has been used as a substitute for this latter drug in low *typhoid* states and *fevers*, *asthma*, *delirium tremens*, and *epilepsy*. Its retention in the new B.P. is a surprise.

Tamarindus—The pulp of the tamarind is seldom used alone; it is a laxative in doses of 1 to 2 ozs., increasing the peristaltic movements of the intestines. It is said to be refrigerant, and is occasionally used in fevers in the form of "tamarind whey," made by mixing an ounce of the pulp in a little boiling water, and adding the infusion to a quart of milk. Its refrigerant action may be accounted for by the vegetable acids, malic, citric, &c., which it contains.

Taraxaci Radix has long enjoyed the reputation of a tonic, cholagogue, diuretic, and laxative. As it is now obtained from the chemist it has little therapeutic power. The tonic effects of the *fresh* juice, prepared by the patient immediately before use, or even of an infusion prepared just after the root is gathered, when the juice is bitter, are decidedly good, and it is a useful vehicle for more active tonics.

Terebene is a powerful antiseptic, disinfecting, and deodorising liquid, with an agreeable balsamic odour, and very complex chemical composition. It is used in *phthisis*, mixed with thymol and carbolic acid in equal proportions as an inhalation (½ dr. to 1 pint of hot water), or sprinkled over wool in an antiseptic respirator.

Internally, it has been given with success in *chronic bronchitis* and *winter-cough* by Murrell as a stimulating expectorant, and the writer has often seen its benefits in these troublesome complaints, especially when *emphysema* is present. It acts like eucalyptus when used as a spray, and is said to exert its good influence over the urinary and gastro-intestinal mucous membranes; and Betrin reports that applied freely on pledgets of lint and kept in contact with uterine epitheliomas splendid results are obtainable.

10—15 minims, in thick syrup or in capsules, may be given three times daily.

The cheap disinfectant liquor sold under this name is a valuable deodoriser for the sick room.

Terebinthina Canadensis, though possessing all the properties of the oil of turpentine, is only used for its physical qualities. It is largely used in the preparation of microscopic objects, and has been occasionally given (made into a pill, with carbonate of magnesium) for *gleet* and *chronic gonorrhœa*.

Terebinthinæ Oleum externally acts as a counter-irritant. The ordinary turpentine stupe is made by sprinkling the oil

over flannel cloths wrung out of very hot water, and applying them quickly to the part. In this way rapid vesication can be produced. It is powerfully antiseptic and antizymotic, and hæmostatic when applied to *fresh wounds*.

Small doses produce contraction of the capillaries, and the vapour causes the minute pulmonary vessels to contract after inhalation, and the secretion is checked.

In large doses turpentine acts as a general stimulant, and, if it does not purge or pass off by the bowels, it causes inebriation, like alcohol, and in very large doses it depresses the functions of brain, medulla, and cord, dilating the vessels, and lowering blood pressure and respiration. After circulating in the blood, it is eliminated by the skin, respiratory mucous membrane, and kidneys, acting as a diaphoretic, expectorant, and diuretic ; and is useful in *bronchitis* and *hepatic dropsy*. It is apt to cause strangury and bloody urine, and should be used cautiously where the kidneys are diseased. Turpentine also possesses very decided anthelmintic properties, but must be given in large doses (½ oz.), and its combination with castor oil renders it much less liable to cause strangury than if given alone. The *tape-worm* is dead on its expulsion after the use of this remedy.

The vapour of turpentine is a valuable hæmostatic in *hæmoptysis*, if the air of the patient's room be saturated with it. Large doses are valuable in *internal hæmorrhages* by reducing the blood pressure, and 20 minims every hour may save life in hæmorrhages from the bowel in *typhoid fever* and *dysentery*. *Hæmaturia* has been successfully treated by small doses.

As an enema it is a valuable remedy in *tympanitic distention of the abdomen;* it excites such uniform contraction as expels all accumulations of imprisoned gas in the bowels. Turpentine has a prophylactic and curative action in cases of *gall stone*, and it may cause the solution of small calculi in the gall bladder. It has been recommended internally on account of its astringent action on the cutaneous capillaries in *psoriasis*, *eczema*, *pityriasis*, &c., and in *iritis*, in *bladder diseases*, and in the *hæmorrhages of purpura*, in which latter it is invaluable. Turpentine may be best given in capsules. Dr. E. Nelson gives 3 drs. of turpentine, 3 drs. ether, 1 oz. syrup of tolu, 1 oz. mucilage, and 5 ozs. Aq. M.P. in table-spoonful doses.

Oil of turpentine which has been kept some time is rich in ozone, and is a valuable antidote to the poison of phosphorus.

Theobromatis Oleum is only used as a basis for suppositories.

Thus Americanum is not used internally. It is added to plasters on account of its mild stimulating influence on the skin, and also on account of its toughness and adhesiveness.

Thymol acts as a feeble caustic, and as a powerful antiseptic. 1 gr. dissolved in 2 ozs. water makes a solution which instantly puts a stop to putrefactive or fermentative changes in any fluid to which it may be added. It is thus a more potent antiseptic than carbolic or salicylic acid; an ointment (1–8 of vaseline) has been used by Squire as a remedy in *parasitic skin diseases.* A solution of 1 part of thymol in 18 of petroleum or 15 of ether is a valuable remedy in ringworm of the scalp or beard; it penetrates into the hair follicles.

The following formula is used at the London Throat Hospital in *laryngitis* and *bronchial affections* :—Thymol, 20 grs.; spirit, 3 drs.; carbonate of magnesium, 10 grs.; water to 3 ozs. A teaspoonful to a pint of water at 150° for each inhalation.

Burns, washed first with a watery solution (½ gr. to 1 oz.) and then brushed with an oleaginous solution (½ gr. to 1 dr.), heal rapidly.

A solution in water (1 in 1,000) is used as an injection in *leucorrhœa*, and as a lotion to *wounds*, *chronic eczema*, *ozæna*, *psoriasis*, and *ulcerated throat.* Thymol gauze and lint are used as antiseptic surgical dressings, and a 1 per cent. solution is used *warm* to swill out the abdomen after operation for perforating peritonitis.

Internally, thymol has an action like carbolic acid, and also produces symptoms like those seen in turpentine poisoning. The centres in the medulla and cord are paralysed, the temperature, respiration, and blood pressure falling markedly before death. It is eliminated by the bronchial and renal surfaces; according to Brunton, these surfaces are congested, and the lungs and kidneys are inflamed in animals poisoned by thymol. It has been given in *typhoid fever*, *pleurisy*, and *pneumonia*, in doses of 25 to 45 grs.; it caused persistent diminution of temperature, and no ill effects. Good results have followed its administration in *chronic cystitis* with profuse discharge, and it has been recommended in *diabetes.* In *diphtheria*, Warren gives it in combination with chlorate of potassium, quinine, and brandy.

Bozzolo urges the administration of thymol in *cholera.* It is the only reliable method of destroying the ankylostoma duodenale when given in doses of 15—30 grs., repeated four times at intervals of two hours, care being taken that no solvent for the drug be administered afterwards. The B.P. dose is ½—2 grs.

It should never be given in solution, as it causes a burning sensation in the throat and mouth.

Volkmann's Antiseptic Liquid consists of thymol 1, alcohol 10, glycerin 20, and water 1,000 parts.

Thyroideum Siccum, and Liquor—The introduction of thyroid gland into therapeutics marks one of the most notable

epochs in the science of treatment. After the recognition of myxœdema came the discovery that it was due to absence or disease of the thyroid gland. Thyroid grafting, injections of the gland substance, and finally the administration by the mouth of glycerin extracts, and other preparations made from the glands of sheep, were tried and proved to be entirely successful in the removal of the disease.

In a short time after a daily dose corresponding to $\frac{1}{8}$ of a sheep's thyroid, amelioration of all the symptoms and signs sets in, the subnormal temperature rises, and metabolism increases (for the appetite improves and the body weight falls), the facial expression changes, and the mental symptoms pass off, and the patient so improves as hardly to be recognised by his friends. The writer has seen a luxuriant growth of hair cover a scalp which had been like polished ivory.

The only danger liable to arise is in pushing the remedy too eagerly, as syncope may occur, and when full doses are administered the patient should be kept in bed. Marked acceleration of the pulse, emaciation, febrile temperature, and gastro-intestinal disturbance are proofs that the drug must be suspended, or given in smaller doses or at longer intervals. 5 mins. of the B.P. liquor in one daily dose by the mouth may be safely given at first, and increased to 15 mins. if improvement does not show itself in 10 or 14 days. 1 minim represents one-hundredth part of a sheep's thyroid. 5 grs. of the dry thyroid in pill, capsule, or tabloid is a fair dose. After the obvious symptoms have passed away, half the above maximum doses every second or third day will be found enough to keep up the improvement.

The drug has been vaunted in exophthalmic goitre, but the writer has tried it in a series of cases, and has never seen anything but harm follow, and in two cases grave injury to the patient resulted, and he believed death was hastened in one of these after a few small doses. The next brilliant discovery in this domain demonstrated that *cretinism* (dwarf growth associated with idiocy) was caused by the congenital absence of the thyroid gland, and results were soon obtained which appeared incredible. 1 to 3 mins. of the liquor may be given in such cases daily; as symptoms indicate, the dose can be increased or diminished. The drug has been successfully used in the treatment of ordinary *obesity*, but its administration requires care. Various skin diseases, as *psoriasis*, *pityriasis rubra*, *ichthyosis*, *eczema*, *lupus*, &c., have been benefited by it. Cheron uses it in threatened abortion with hæmorrhage, and as a galactagogue. Serafine extols the thyroid treatment in simple goitres, especially in the form known as struma parenchymatosa. Gauthier has successfully administered thyroid in cases of ununited fracture.

Telford Smith has drawn attention to the tendency of the bones to bend in cretins under thyroid treatment.

Tragacantha—This gum is only employed to aid the suspension of heavy metallic powders in mixtures, it swells upon the addition of water into a thick mass or mucilage, which readily diffuses through any quantity of water. In the official mucilage of tragacanth it is doubtful if the gum can be correctly regarded as in a state of perfect solution.

Trinitrin or Nitroglycerin acts like nitrite of amyl, but its effects are more prolonged. One or two of the tablets cause in about 3 minutes throbbing and fullness of the head, soon spreading over the entire body; the increase in the pulse rate, and of the flushing of the face, is considerably less than that resulting from amyl. The blood pressure falls, the temperature is but slightly depressed in ordinary doses, but giddiness and severe frontal headache often last for a considerable time. If the dose be increased the pulse and respiration are greatly quickened, paralysis of the motor and sensory centres of the cord occurs, the heart becomes very much weakened, and the respiration slower, and finally death from paralysis of the respiratory centre supervenes, and the blood assumes a dark chocolate colour, as in poisoning with nitrite of amyl and nitrites of sodium and potassium.

Hay believes that the activity of nitroglycerin is due to the nitrous acid which is formed by its decomposition within the body. He shows that the astonishing activity of so small a dose as $\frac{1}{100}$ gr. is owing to its being absorbed unaltered by the stomach, which decomposes to a great extent the ordinary nitrites, and the *nascent* nitrous acid formed by its final decomposition in the blood and tissues exerts a more incisive action than the nitrous acid of a nitrate. (Nitroglycerin is a *nitrate* of glyceryl.)

Murrell has found that excellent results follow its administration in *angina*, where its action, though not so prompt, is much more lasting than that of amyl. One tablet is given every 3 or 4 hours, and the dose gradually increased till 3, 4, or 6 be taken during the threatening of an attack.

☞ The writer believes that the method by which he employs this drug in *angina* will give better results than any other treatment of this serious malady. He directs the patient to break up each tablet into 8 or more portions, one of which he takes every 15 or 20 minutes during the day. There is really no difficulty in administering the drug so frequently, and patients readily adhere to the plan which saves them headache and malaise, and generally they appear unconscious of any action of the remedy when so administered save that the attacks are prevented. Larger tablets of the official strength are more convenient. The writer has never failed with the

drug when so employed. The plan is based upon a study of its physiological action. In cases of threatening attack, of course a large dose should be given, and the effects kept up by small ones.

It has been successfully used in *epilepsy*, *Bright's disease*, *neuralgia*, *tinnitus*, *puerperal eclampsia*, *asthma*, *migraine*, &c. It has been given with elaterin in *myxœdema*, and to cut short attacks of *renal* and *hepatic colic*, and *ague*. It may be given in 1 to 3 or 5 minim doses of the 1 per cent. solution. Small doses prevent *sunstroke*.

Nitroglycerin will often prevent *sea-sickness*, and the writer has noticed a peculiar effect which it sometimes produces if the treatment be commenced *after* sickness has already occurred, *i.e.*—the patient may continue to vomit but all feeling of depression and nausea disappear, and the physiological action of the drug does not take place. It is, however, a dangerous remedy to trust in unskilled hands.

Uva Ursi is a vegetable astringent and tonic, owing to its contained tannin. It contains arbutin, which, after absorption, is split up into hydrochinon in the blood, and, as the sulphate of this body, it passes out in the urine ; it is recommended in *chronic inflammatory conditions of the bladder* where there is much discharge. It has been used in *menorrhagia*, *dysentery*, and *gleet*. (See under Arbutin, in the Non-Official Remedies.)

Valerianæ Rhizoma—Valerian acts as a tonic and stimulant to the nervous system, and is especially useful in *hysteria*. It contains a volatile oil, which paralyses the cerebral nerve centres and cord, and reduces the blood pressure and slows the pulse (Brunton). Large doses of the infusion of the rhizome increase the rapidity and force of the ventricular contractions, cause an increase in the cutaneous secretion, and produce hiccough, nausea, vertigo, and slight mental disturbance. The good it effects in disease appears to the writer *to be owing to its diminishing the irritability of the terminations of the sensory nerves throughout the body*. This probable explanation of the action of valerian mentioned in a former edition of this work is supported by the results of Martel's recent observations ; he found that a strong decoction possessed marked *local sedative* influence when applied to *painful wounds*. He states that the inhabitants of Normandy use a lotion made from the root to relieve the pains of fractures and wounds. Binz found that a previous injection of the oil always prevented the convulsions which are produced by brucine and ammoniæ carb. owing to its sedative action upon the spasm centres.

It has been used with doubtful success in *diabetes insipidus*, *chorea*, *epilepsy*, *whooping-cough*, *laryngismus*, &c.

The salt of zinc with valerianic acid, in addition to its anti-hysterical properties, is a weak anti-periodic ; and, combined with quinine and opium, is a valuable remedy in the treatment of *neuralgia*, especially if there be a tendency to show signs of periodicity, and it has been recommended in *diabetes*.

Veratrina, the alkaloid of cevadilla, is a violent irritant poison, producing vomiting and purging, with intense abdominal pain, convulsions, extreme muscular prostration, and great cardiac weakness and collapse, with a prickling sensation felt in the skin of the body. It exerts its action chiefly upon the *muscles* by producing *prolonged contraction*, which Brunton found could be removed by extremes of heat and cold. The sensory and motor nerve endings, at first stimulated, become paralysed, and the heart muscle, after slow and prolonged contraction, is arrested in systole, the pulse and blood pressure, having at first become increased, then fall markedly. The respirations, at first quickened by small doses, become slowed by large ones, and finally paralysis of the vagus and respiratory centre takes place. It is only used externally.

Veratrine, applied to the skin, paralyses the filaments of the sensory nerves, acting as a local anæsthetic, and hence has been used as an application in the form of the official ointment to various *neuralgic nerves*. The best results have followed its use in the case of the fifth nerve, and it has been found useful in *severe sciatica* and *sick headache*, when rubbed over the affected or tender nerves. Its use is generally followed by some local irritation in the skin. When it comes in contact with the nasal mucous membrane it acts as a sternutatory and an errhine.

Vinum Aurantii and Vinum Xericum are introduced into the Pharmacopœia for their solvent properties ; the former to make quinine and citrate of iron wines, and the latter to form the menstruum for the remaining wines.

Zincum and its salts. When used externally these substances are astringent and corrosive.

The astringent quality probably depends upon their forming insoluble albumen compounds, causing condensation of the tissue elements, at the same time producing contraction of the smaller vessels. The corrosive action depends upon their affinity for water, which they rapidly extract from the tissues, thereby causing their death. The effect varies in intensity from the powerful action of the chloride and iodide to the mild influence of the sulphate or oxide.

When administered internally, the zinc salts soon enter the blood, in which fluid they remain for a time, probably as albuminates, and are gradually and slowly eliminated in the

fæces and slightly by the kidneys. After a long course of zinc medication, symptoms of chronic poisoning may show themselves, not unlike those seen in cases of lead poisoning.

Acetate of Zinc—This salt is used as a local astringent, and with some skilful practitioners is their favourite remedy in *gonorrhœa* and other discharges. The following is a valuable injection, and with six times as much Tr. Lavandulæ Co. constitutes the "Red Lotion" of Hospitals :—

℞ *Zinci Acet.* *gr.* xxv.
Tr. Lavand. Co. ℥.xxv.
Aquæ Destillatæ ℥x. *Misce.*
Fiat injectio, secundis horis utenda.

Carbonate of Zinc and *Calamina* are used as mild, unirritating astringents or "drying applications" to *excoriations*, *intertrigo*, &c. They resemble the oxide in their action upon *eczema*.

Chloride of Zinc is much used as a powerful caustic by surgeons for the destruction of *lupoid*, *cancerous*, and other *growths*. It is best applied mixed with about three parts of dry flour, and laid upon the diseased spot. Great care is necessary to prevent its spreading to the surrounding healthy parts; this is best accomplished by sprinkling them over with plaster of Paris. Jules Felix applies for 6 to 24 hours the following in fine powder made into a putty with water:—Dry chloride of zinc, 110; starch, 37; wheaten flour, 112; corrosive sublimate, 1; iodol, croton-chloral, bromide of camphor, and carbolic acid, of each, 10. This paste is painless, does not spread, and keeps indefinitely.

The astringent qualities of the chloride have rendered it a valuable remedy in *gonorrhœa*, injected in the proportion of about 1 gr. to the ounce every two hours. It destroys the low organisms upon whose presence the disease depends. It is a powerful antiseptic and deodorant. The liquor diluted with forty times its bulk of water arrests putrefaction and decomposes all gases with which it comes in contact. It may be used as a lotion to *putrid ulcers*, in the proportion of 3 minims to each ounce of distilled water. Burnett's fluid is a concentrated impure solution.

Oxide of Zinc is chiefly used as a mild, soothing astringent in *eczema*. The zinc ointment is the best remedy for the troublesome *eczema of childhood* and *infancy*.

Internally, the oxide is found to enter the blood as lactate or chloride, and to exercise the functions of a mild astringent and sedative to the nervous system, and it has been extensively used in *epilepsy*.

In the *sweating of phthisis* the oxide has long enjoyed a high reputation, and may be used in the following form :—

℞. *Zinci Oxidi gr.* v.

Ext. Belladonnæ Vir. gr. ss. *Misce.*

Fiat pil. mitte tales xvi. *st.* i. *ter in die.*

Sulphate of Zinc is the most popular local astringent, and is used in the following strengths in each oz. of injection :—

In *Gonorrhœa*, 2 grs. ; in *Leucorrhœa*, 3 grs. ; in *Otorrhœa*, 1 gr. ; in *Ophthalmia*, 1 gr.

The dried salt is used as a caustic to *uterine* and other *ulcers*.

Internally, the sulphate has been found highly useful in *chorea*, given in doses, beginning with 2 grs. for a child of about 7, increased to 10 grs., 3 times a day. The stomach in a very short time becomes markedly tolerant of large doses. Its use has been advocated in *epilepsy* and other *convulsive ailments*, in *bronchorrhœa* and *diarrhœa*, but with varying success.

In doses of 30 grains, sulphate of zinc is the speediest and safest emetic, and is especially useful in cases of poisoning, being quicker in its action than ipecac., and much less liable to be followed by depression than tartar emetic. It acts by irritating the nerve endings in the stomach, and hence has been regarded as the type of local emetics. It is not a safe emetic for young children, but may be given in doses of 2½ or 3 grs. to a child one year old, when an urgent action is required, and the dose may be repeated in 15 minutes. For a child 5 years old 10 grs. may be given, followed by copious warm water draughts.

For the *Valerianate of Zinc* see Valerian.

Oleate of Zinc acts like the ointment of the oxide.

Sulphocarbolate of Zinc possesses the properties of the sulphocarbolates (page 471). It is sometimes used as an antiseptic lotion in *gonorrhœa* and *leucorrhœa*, 2 grs. to 1 oz.

Zingiber is a powerful aromatic stimulant, acting like capsicum and cardamoms (which see) ; chewed, it is a valuable sialagogue ; and used as snuff, it causes severe nasal irritation.

PART V.

NON-OFFICIAL REMEDIES.

Abrin. See under following :—

Abrus Precatorius (Jumble or prayer beads, Jequirity seeds) have been used for producing jequirity ophthalmia by Wecker with a view to curing granular ophthalmia. A 1 per cent. infusion applied to the conjunctiva produces intense inflammation, followed by the formation of a croupous membrane, which separates upon the third day to form and separate again in a few days. Much speculation existed about the action of the drug, since the infusion was found to swarm with a peculiar microzyme; but Klein produced the inflammation by sterilised infusions, and Martin proved that the activity of the seeds depended upon an albumose and globulin identical with the active ferment found in papain. It has proved useful in granular lids, especially where the trachoma has disappeared, leaving a thick pannus. It is, however, a dangerous remedy, and corneal destruction has followed its too frequent application. Shoemaker applies a paste, 1 to 4 of water, in lupus, tubercular and syphilitic and indolent ulcers. The infusion has also been applied to granular metritis. Under the name Abrin the active principle has been isolated and used, but it is a terribly potent poison, acting like snake poison on man, even in doses of $\frac{1}{100}$ grain.

Absinthium—The leaves and flowering tops of Artemisia A., commonly known as wormwood, have been used as a stomachic or bitter tonic in 3i. doses of the tincture (1 in 10). The French liqueur is the source of much drunkenness, and it produces, in addition to the ordinary effects of alcohol, a form of delirium tremens characterised by epileptic convulsions. Though the drug finds a place in nearly all the Continental pharmacopœias it is wisely still refused a place in the B.P. The oil powerfully stimulates the brain and produces symptoms like camphor.

A.C.E. Mixture. (See page 363).

Acid. Agaricum. (See Agaricus.)

Acid. Alpha-Oxynaphthoicum is a naphthol derivative, existing as a white, almost inodorous powder, scarcely soluble in water, though it dissolves in glycerin and oils. It costs little and has powerful antiseptic properties, being five times stronger than salicylic acid. It promises well as a disinfectant, and has been used as an ointment ($\frac{1}{2}$ per cent.) in scabies.

Acid. Camphoricum—This white, odourless acid is obtained by the action of nitric acid on camphor. Reichert has found that it exercises a marked destructive action upon the tubercular bacilli in the body when a solution is injected into the peritoneal cavity. It has been used in laryngeal phthisis, coryza, &c., applied as a spray or linctus in 4 per cent. alcoholic solutions. It has been given internally in cystitis, irritability of the bladder, and incontinence of urine, and in a host of nervous diseases, as epilepsy, chorea, &c., and in acne, in doses of 5 to 10 grs. Its best effects are seen in the treatment of the night sweats of phthisis. Stockman and Hare testify to its value in this condition. Hare gives 20 grs. in cachets one or two hours before the sweating is expected. A $\frac{1}{2}$ per cent. solution has been used for washing out the bladder in obstinate cystitis.

Acid. Catharticum is a brown, nearly tasteless, soluble glucoside obtained from senna. It has been given to children in constipation, dissolved in sweetened water, in doses of 1 to 2 grs.; 6 grs. may be given to adults. It gripes less severely than senna. The purgative principles of senna are the magnesium and lime salts of this acid. The pure acid is unstable. It is also known as Cathartinic Acid.

Acid. Cinnamicum exists in micaceous, inodorous crystals, obtained by oxidising oil of cinnamon. It is only slightly soluble in water, but is a powerful antiseptic, and has been vaunted as an intravenous injection for the cure of tuberculosis. The soda salt is soluble.

Acid. Cresylicum. (See Cresol.)

Acidum Glycerino-phosphoricum and its salts, according to Robin, act as powerful nerve tonics; after absorption they have an accelerating action upon nitrogen metabolism, and he believes that their use tends to the saving of nerve energy. Some of the reporters on these drugs speak of their great value as supplying phosphorus to the tissues. This is misleading, as the acid is absorbed as such and appears in the urine as phosphoric acid, and it is unlikely that free phosphorus results from their administration. This acid exists in testicular juice.

The potash and soda salts may be given hypodermically in 5 gr. doses in 15 mins. water, and the iron and lime salts by the mouth in similar doses 4 or 6 times a day in neuralgia, influenza,

hysteria, &c. Solutions or mixtures of the glycerino-phosphates must be made fresh, and are incompatible with carbonates and phosphates.

Acid. Gynocardicum. (See Chaulmoogra Oil.)

Acid. Hydrofluoricum is a powerfully corrosive liquid, readily attacking glass and causing a deep destruction of animal tissue. The diluted acid (1 in 600) has been successfully given in goitre by Woakes, in doses of 20 to 60 minims. The fumes of the acid have been inhaled in diphtheria, but the remedy has never obtained wide trial. Garcin thought that the immunity of glass makers from phthisis was owing to the destructive action of this agent upon the bacilli, and he treated patients by keeping them for an hour in a chamber whose air was acidified by the acid, and though he reported success, the treatment has been allowed to fall into disuse. Fluorides of ammonium and iron have been administered in cases of splenic enlargement by Lucas—5 to 30 minims of a 1 in 120 solution. Salufer is the name of a disinfectant consisting of neutral sodium silico-fluoride.

Acid. Osmicum or **Perosmic Acid** is prepared by heating metallic osmium. A hypodermic injection of 5 minims of a freshly-prepared 1 per cent. solution into the tissues over the painful spots in the course of neuralgic nerves has given excellent results. Bilroth found it to cure sciatica which had resisted treatment for years, when injected deeply between the ischium and trochanter.

15 minims may be injected, but the solution should be freshly prepared. The writer injects deeply 1 to 2 minims in 5 or 6 places over the course of the sciatic nerve in sciatica. It has been injected into strumous glands, cancers, and goitres, and deeply into the muscles in lumbago and muscular rheumatism, but with varying success. Wildermuth has reported the results of two years' trial of the drug in many cases of intractable epilepsy. In some, marked amelioration of the symptoms occurred. He gave the aqueous solution, but found better results from $\frac{1}{64}$ gr. osmiate of potassium in pill, 15 of which was the maximum daily allowance. No ill effects were noticed.

Acid. Phenylaceticum crystallises in irridescent scales, which are very soluble in boiling water, though only slightly soluble in cold water. Williams has employed this remedy internally with success in phthisis, reporting that after its administration the cough diminishes, the appetite improves, and there is a general amelioration of all the symptoms and physical signs. Alivia has used it in typhus and typhoid fevers.

10 to 15 minims of an alcoholic solution (1 in 6) may be given in 2 ozs. water.

Acid. Picricum (Trinitro-carbolic Acid) — A yellow substance formed by slowly mixing carbolic with fuming nitric acid ; it is known as Picric or Carbazotic acid, and is used as a yellow dye. It has been introduced as a test for sugar and for albumen in the urine ; a saturated solution of the acid in water throws down a cloud, even when the albumen is in small quantity. Recently, glowing accounts are published of the value of the acid in burns and scalds, when applied on lint soaked in a watery solution of 1 in 200, and the parts bandaged in wool. Thiery recommends the drug in eczema, chilblains, &c., but it should never be used as an ointment or powder. It seems to be now accepted as the best remedy for the treatment of burns and scalds ; the dressing need not be changed for two days, and no impervious covering should be placed over the lint, the solution being allowed to dry by absorption and evaporation. The same method should be used in treating acute eczema, which rapidly heals under this plan.

It has been tried in erysipelas, apparently with some advantage. The saturated solution should be painted over the affected parts. Its administration generally produces yellowness of the skin.

The picrate or carbazotate of ammonia in 1 gr. doses has been reported as successful in exophthalmic goitre.

Acid. Pyrogallicum, or **Pyrogallol,** constitutes the white feathery crystals which sublime upon heating gallic acid. It is a powerful antiseptic from its affinity for oxygen. Introduced by Jarisch, it has been found useful in the form of his ointment (1 dr. to 1 oz. of lard) when brushed over the patches of psoriasis. If applied in concentrated form it is a powerful local irritant, and has been used to cause the destruction of epithelial cancers, chancres, lupus, &c. It stains the skin and hair dark, though not so deeply as goa powder.

$\frac{7}{8}$ grain in solution every hour has been proved useful in internal hæmorrhages, but it is a *dangerous* drug, and should never be administered internally. Alarming symptoms have followed the application of the ointment, which should only be applied to limited surfaces, and several deaths have occurred in psoriasis from its use. Vidal applies it in powder mixed with four times as much starch, and blown upon phagedenic chancres, or applied as an ointment (1 in 6). The writer has ceased to employ the drug, even externally, owing to its dangerous properties, and he has seen sloughing follow its use. See under Pyrogallol, where a non-poisonous preparation is described.

Acid. Scleroticum is one of the active principles found in ergot. It is doubtful if it will cause contraction of the uterus, and the results attributed to its action have been caused by other principles of ergot which were incorporated with it. It may be

given hypodermically in doses of ½ gr. dissolved in 5 minims o water. The solution must be fresh; the substance itself is very hygroscopic.

Acid. Sulphocarbolicum.—See Aseptol.

Acid. Trichloraceticum is a crystalline antiseptic body soluble in water. Applied to the skin, it acts as a powerful but comparatively painless caustic. 1 per cent. solutions destroy nearly all forms of bacterial life without causing irritation of the skin, and have been found useful as a dressing for wounds, ulcers, venereal sores, erysipelas, &c.

Internally, 2 to 5 grs. of the acid in dilute solution have been recommended in diarrhœa, gastric catarrh, and gastric cancer.

Excellent results are reported from its use in the concentrated form when applied as a caustic in chronic pharyngitis. 50 per cent. solution is used like cold nitric acid as a test for albumen in the urine.

Acid. Trichlorphenicum is derived from carbolic acid and exists in acicular crystals. It is insoluble in water, but forms soluble salts with alkaline bases which have been used as antiseptic dressings and as disinfectants, being much stronger than carbolates. The magnesium salt, 4 grs. to 1 oz., has been used in conjunctivitis and purulent ophthalmia.

Trichlorphenic Acid is also known as Trichlorphenol. It is stated to be 25 times stronger than carbolic acid.

Actol, or lactate of silver, has recently been introduced by Crédé, who has found the drug to be as powerful almost as corrosive sublimate in destroying germs. He injected the remedy (⅙ gr. in 7 mins. water) into the subcutaneous tissue of the abdominal wall in hopeless cases of anthrax with success, and also in a more dilute solution in erysipelas with similar results. The injections should be made under cocaine. 1 grain in 10 ozs. water may be used as a gargle or lotion.

Adonis Æstivalis has been much used in Italy, and Albertoni, after experiments, reports that he has found it of great value in cardiac insufficiency, with rapid pulse, dyspnœa, anasarca, and diminished amount of urine. It is a powerful diuretic, in doses of 2 grs. in infusion every 6 hours. It closely resembles in its action Adonis Vernalis.

Adonis Vernalis resembles digitalis in its action; it contains a glucoside—adonidin—which acts like digitalin. It has been given in cardiac diseases, where it has strengthened the ventricular contractions, and reduced the frequency and increased the strength of the pulse, with very little action upon the arterioles. It is not cumulative. It is doubtless a remedy of great power, but it is doubtful if it will accomplish in failing

compensation as good results as digitalis. It can, however, be given in the intervals when digitalis is suspended. Da Costa points out its chief indication to be dilatation of the heart, and finds it is not well borne in hypertrophy. One table-spoonful of an infusion (½ oz. to 10 ozs.) should be given every three hours. The drug has been recently recommended in epilepsy with bromides.

Merck's Adonidin should be preferred to the crude drug; it is hygroscopic, but keeps well in chloroform water. ⅓ gr. may be given 4 or 6 times daily.

Æsculus Hippocastanum, or horse-chestnut, has been recommended in diseased conditions of the rectum and anus, as in painful hæmorrhoids, especially where there is little bleeding and no constipation. Mayhoffer has found it rapidly effective in pharyngo-laryngitis, and Wilde believes that it will prove of great value in the common combination of congested liver and pharyngeal catarrh.

Æsculin, a glucoside from the rind of the fruit, has been recommended in malaria; and Æscorcin, a derivative from it, is used to detect defects in the cornea owing to its temporary red staining (10 per cent. solution).

Æther Hydrobromic. and Hydriodic. —(See Æthyl Bromidum and Æ. Iodidum).

Æther Methylicus is an inflammable gas with an unpleasant ethereal odour, prepared by distilling a mixture of methylic alcohol and sulphuric acid. A saturated solution in ether, under the name of methylic-ethylic ether, has been used as a substitute for chloroform by Richardson, but it is not likely to come into general use owing to its rapidity of volatilizing and its disagreeable odour.

Æthyl Bromidum, Bromide of Ethyl, or Hydrobromic Ether, is a liquid obtained by the action of sulphuric acid and alcohol on bromide of potassium, or by distilling a mixture of phosphorus, alcohol, and bromine. It has been extensively tried in America as an anæsthetic, especially in ophthalmic practice. Its action upon the heart and respiration is the same as that of chloroform, from which it differs in the *rapidity* of its action (1 to 3 minutes) and the *promptness* with which patients come from under its influence; it has, however, the drawback of being more irritating to some patients. It certainly has been demonstrated to be more dangerous than chloroform or ether, and as a general anæsthetic its use should be abandoned. It is especially dangerous when phthisis, renal, or cardiac disease is present. It is decomposed readily by light. With some operators about 45 minims poured on a folded towel and placed over the patient's face cause anæsthesia in 1 minute. Chloroform

is then poured on, and the narcosis kept up by this latter drug. At least five deaths are reported from the bromide of ethyl. It is not inflammable, and is valuable for its *local* anæsthetic effect, which can be produced by simple contact with a little of the liquid on lint, covered or not with oiled silk, or better still by being sprayed upon the part by a spray producer. It has also been administered internally as an antispasmodic. It should not be confounded with Ethylene Bromide.

Æthyl Chloridum is a colourless, ethereal, inflammable liquid, closely resembling sulphuric ether in its action; it is introduced as a local anæsthetic for neuralgia, toothache, &c. It may be used in the form of a spray, or by being blown through a capillary tube in a fine jet it soon produces insensibility in the area of skin to which it is applied.

☞ The formula of this substance, which is also known as Chelen and as Muriatic Ether, is C_2H_5Cl. Chloride of Ethyl is wrongly used as a synonym for Ethidene Dichloride.

Æthyl Iodidum, or Hydriodic Ether, is a liquid prepared in the same way as ethyl bromide, by substituting iodine for bromine. It has been tried with success in cardiac dyspnœa and in spasmodic affections of the larynx and bronchial tubes, and has been used as an inhalation in bronchitis and catarrhal laryngitis, in syphilitic ulceration affecting any part of the air tract, in laryngeal tuberculosis and pertussis. It is an expectorant, and often gives relief in asthma, by cutting short the attack or rendering the breathing easy and deep. It should be used like nitrite of amyl, and can be had in glass capsules, 5 mins. in each, as recommended by Martindale. It affords the best method of saturating the system rapidly with iodine, upon which substance the activity and efficacy of its action to some extent depend; 3 or 4 capsules may be used at once. When painted on the skin and covered with wadding and oiled silk it is rapidly absorbed, and the system may be saturated with iodine in this manner.

Agaricus Albus, White or Purging Agaric, is a fungus growing upon the old trunks of the larch.

15 grs. of the powdered fungus, or $\frac{1}{5}$ gr. Agaricin or Agaric Acid (a white crystalline powder) has a very decided action in checking the night sweats of phthisis. It was formerly used as a purgative, and in large doses causes watery stools; in small doses it checks diarrhœa and dysentery, and is useful in hæmoptysis; it diminishes the secretion of the bronchi and mammæ.

After copious sweating is checked by agaricin, the cutaneous and pulmonary discharges remain unaltered, the urinary organs discharging the surplus of liquid, and the diminished thirst decreasing ingestion of liquids. Moderate perspiration yields to a single $\frac{1}{6}$ grain dose, whilst profuse sweating requires repeated

equal or increasing doses for its suppression, the physiological action of the drug manifesting itself five hours after its exhibition without any undesirable symptoms. It is best given in the pill form with a grain of Dover's powder.

Agaricus Muscaria. (See Muscarine.)

Agathin is a compound of salicylic aldehyde with methylphenylhydrazine, in greenish-white insoluble scales. It is used as an anti-neuralgic and anti-rheumatic agent where salicylic acid is indicated, as in acute rheumatism, sciatica, &c., in doses of 8 grs. *ter die* in cachet or in lemonade. Its anodyne action does not show itself for two or three days.

Airol is the name given to Bismuth oxy-iodide-gallate. It is a light greenish, tasteless, insoluble powder, possessing powerful antiseptic properties, and has been dusted over foul ulcers, operation wounds, chancres, intertrigo, &c., as a substitute for iodoform, and injected as an emulsion with glycerin (10 per cent.), or insufflated into the urethra in gonorrhœa. For ozœna, lupus, ingrowing toe nails, and indolent ulcers, it promises to supersede most antiseptics and astringents.

Alantol is an aromatic, oily liquid, obtained from Elecampane root. It is introduced as a remedy for tuberculosis and bronchitis (see under Helenin), in doses of $\frac{1}{4}$ minim in capsules or tabloids.

Alembroth Salt, or Ammonio-Mercuric Chloride, is the substance formed when solutions of corrosive sublimate and sal ammoniac are mixed together. It exists in rhombic prisms, which are very soluble in water, and which do not very readily combine with albumen. For this latter reason it is prized as an antiseptic dressing, being much less irritating than solutions of pure sublimate. It is the salt which some authorities recommend for hypodermic injection in syphilis. Bloxam uses the following solution for this purpose :—32 grs. sublimate, 16 grs. chloride of ammonium, in distilled water 2 ozs.; the dose of which is 10 minims. (See author's "Dictionary of Treatment," page 877.) 3 grs. sal alembroth contain 2 grs. sublimate. As a dressing it is generally used in the form of gauze containing 1 per cent., and coloured blue by aniline. The pink gauze—Eucalembroth—contains in addition eucalyptus oil.

Allium, or Garlic.—The volatile oil—Sulphide of Allyl—obtained from the clove of garlic is a powerful expectorant of the stimulating class, and markedly increases the bronchial secretion, and renders it less difficult in being expelled. Garlic appears to act like the onion (see page 474) upon the bronchial mucous membrane during the process of excretion by this channel. It is valuable also as a rubefacient in bronchitis, and is a certain

anthelmintic, killing the round worm. It is a powerful antiseptic, and in the concentrated form will produce vesication, purging, and vomiting. The oil is not given internally, owing to its irritant qualities, but the fresh juice in 30 minim doses, or the tincture of the bulblets (1 to 5) in dessert-spoonful doses, will act as a valuable expectorant and diuretic; ½ oz. of the syrup of the U.S.P. is the most agreeable preparation.

Recently Sejournet injects allyl sulphide into the supraspinous fossa in phthisis. 1 min. is dissolved in 2 drs. sterilised olive oil, and of this 20 mins. are injected every day.

Alphol. (See under Betol.)

Althæa, or Marshmallow Root, has been long recognised as a valuable demulcent and emollient, and enjoys great popularity in bronchitis and catarrhs. The entire plant—leaves and young branches—made into a fomentation (4 ozs. of the dried herb to 1 pint), has been used to prevent suppuration and to relieve pain and tension in the inflamed mammary gland and in various acute joint affections. An ointment made by boiling the chopped leaves in lard (1 to 1) and straining has been in use for a variety of skin affections, and has been recommended in the treatment of palmar psoriasis.

Althein is a crystalline body identical with *Asparagin*, and may be obtained from the root of marshmallow and asparagus. It possesses diuretic qualities, and is, in medicinal doses (2 grains dissolved in 4 drachms of water) a remedy in cardiac dropsy, Bright's disease, and gout, which has given results worth further trial.

Alumen Ammonio-Ferric. or Iron Alum.—This pale violet-coloured salt is an ammonia iron-alum, in which ferric oxide replaces oxide of aluminium.

It possesses stronger astringent properties than ordinary alum, is more soluble and less irritating in small doses, and may be used where an unstimulating iron salt is indicated with a good astringent. It is in hæmorrhage from the kidneys, and especially in intermittent hæmaturia, that its virtues have been found to surpass those of other astringents; 5 to 10 grs. given four times a day will sometimes be found to diminish the albumen in Bright's disease. 1 dr. to 8 ozs. water makes a good astringent gargle in relaxed and inflamed conditions of the throat.

Aluminium Aceto-Tartrate is very readily soluble in water; it has a pleasant taste, and is not poisonous. It possesses powerful antiseptic properties, and is considered by Athenstædt to be more stable and easily prepared than the Acetate of Aluminium, which is a powerful antiseptic, more energetic than thymol and salicylic acid.

Aluminium borico-tartrate (or Boral) and the tannate (or Cutol) are used as ointments (10 per cent.), or powders in eczema, ulcers, &c. The soluble tannate or Tannal, and the corresponding Gallal, are useful when tannin is indicated. (See also under Salumin.)

Alumnol is the name given to an aluminium naphthol sulphonate in the form of a white soluble powder. It is a powerful astringent and precipitates albumen, but the ppt. is soluble in excess. It is powerfully antiseptic, and 1—2 per cent. solutions are used for otitis, gonorrhœa, leucorrhœa, conjunctivitis, endometritis, and 5 per cent. ointments for ulcers and chancres. A 20 per cent. solution is used as a caustic. Sozal is the name given to a similar aluminium substance prepared from phenol, it possesses similar action. Boroformate of aluminium has the same action and indications as alumnol.

Alveloz is the name given to the juice of Euphorbia heterodoxa, which has been used as a local painless caustic when applied to ulcerating cancers and epitheliomas. The juice is preserved from decomposition by the addition of a little salicylic acid. In cancer of the os and cervix it has given excellent results as a caustic by relieving pain, checking hæmorrhage, and diminishing discharge.

Amyl or Anodyne Colloid, is a thick liquid used for painting over the course of painful nerves in neuralgia, sciatica, &c. It is prepared by dissolving 6 grs. veratrine, 1 gr. aconitine, 1 oz. hydride of amyl (Pentyl hydride) in 1 oz. collodion.

Amylene Hydrate is a colourless tertiary alcohol acting like chloral, but with little depressing effect upon the heart. There is little or no preliminary excitement, sleep occurs often in a few minutes; it seldom fails in its action even in those accustomed to narcotics, and no after ill consequences follow on awaking. It may be safely given to children. To adults it may be given in doses of about 50 minims in claret or suspended in a flavouring syrup, or it may in the same dose be administered by the rectum, or given in capsules. Its strong taste and smell, and its high cost, are barriers to its use. No ill effects have been noticed after doses as high as 2 drs., but occasionally symptoms resembling alcoholic poisoning have been recorded. It has been used successfully in a number of serious ailments, as delirium tremens, mania, &c., and Wildermuth has obtained excellent results in epilepsy of a severe type where bromides fail, also in petit mal and in pertussis. It should not be given in epilepsy till a considerable interval after the cessation of bromide treatment. The drug is also known under the name of Dimethyl-ethyl-Carbinol.

Amyloform. (See under Formalin).

Amylum Iodatum consists of iodine 5 parts, triturated with a little distilled water, and rubbed carefully with prepared starch 95 parts. It is used as a means of administering iodine, and may be given in doses of 2 drs. rubbed up in milk or water. It can be employed as a dry dressing in every case in which iodoform is indicated. It has also been recommended as an antidote in poisoning when the nature of the poisonous drug is unknown.

Anacardium or Cashew Nut.—The oily liquid obtained from the pericarp has been held to be a cure for leprosy. It contains 90 per cent. of anacardic acid. Internally it has been given as an anthelmintic, but it is chiefly used as an external application to ringworm and leprous ulcerations. It has been seldom employed in this country. Cardol, its active principle, is used as a blistering oil.

Analgen is a substance analagous to antifebrin, but derived from the chinoline group. It is introduced as an analgesic, and it is claimed for it that it has no drawbacks, but its sparing solubility and the red discoloration of the urine which it produces are objections. It is indicated in every condition in which antipyrine is used, and good results are claimed in rheumatism and hysteria and asthma. The dose is 10 grs. *ter die*.

Anemonin. (See Pulsatilla.)

Aneson, or Anesin, is a new local anæsthetic consisting of a 1 per cent. solution of aceton-chloroform. It is claimed to be about equal to a 2 per cent. cocaine solution, and to be devoid of all irritating qualities. It has been used in the removal of small tumours, in teeth extraction, and in eye surgery.

Anhalonium Lewinii is a plant of the cactus order, the tops of which are known as mescal buttons, and are used by the Mexican Indians to produce intoxication. About 4 of the buttons cause pleasing mild delirium, with visions of beautiful colours and objects. The pupils dilate, and the muscular power is diminished, but the organic functions are not disturbed. Prentiss and Morgan, who have reported on the drug, believe that it will prove useful in the excitement of fevers. Pellotine is the name given to an alkaloid obtained from the mescal button; in doses of 1 grain it has been found to act as an hypnotic like morphine, and Hutchins has administered it in insomnia, but vertigo, headache, and nausea follow its use. Tinctures made from the buttons appear to be worthless.

Anilipyrine is a white and very soluble powder, obtained by fusing two parts of antipyrine with one of antifebrin. It possesses all the advantages of both remedies as an antipyretic

in rheumatism and influenza, and as an analgesic in migraine and neuralgia, in doses of about 12 or 15 grs.

Anthrarobin is a yellowish-white powder produced by reducing alizarin, into which it readily changes by absorbing oxygen. Liebermann introduced it as a substitute for chrysarobin in psoriasis. It does not stain or irritate, but some authorities deny its usefulness. It is applied as an ointment (1 to 8).

Antiseptol is a brown, insoluble powder without odour, obtained by mixing solutions of iodated iodide of potassium and sulphate of cinchonine. It is the iodosulphate of cinchonine and contains 50 per cent. of iodine, and is introduced as a substitute for iodoform on account of its cheapness and freedom from odour, by Ivon, who maintains that it is more efficacious as an antiseptic. Shoemaker has used it with excellent results in the form of an ointment (1 dr. to 1 oz. zinc ointment) for lupus, ulcers, &c. Internally it has been given by Woodbury in doses of 1 to 5 grs. in phthisis, and by Shoemaker in scrofuladerma, lupus, syphilis, and psoriasis.

Antithermin, or Phenyl-hydrazin-lævulinic Acid, is a coal tar derivative. The anhydride only is used in medicine, and it possesses properties closely allied to antipyrine; thus it reduces fever heat, and has powerful analgesic qualities. It causes irritability of the stomach and vomiting; the ordinary dose in tabloid form is 5 to 7 grains.

Antitoxins—The introduction of the various serums in the treatment of certain parasitic diseases marks the most brilliant epoch in therapeutics. Only the briefest reference to this great subject can be made in the limited space available in this portion of the present volume.

Antidiphtheritic Serum—It is needless to detail the various steps which led up to the great discovery of Behring, who demonstrated that an animal may receive gradually increasing doses of the living cultures, or of the sterilised chemical poison of diphtheria, till complete immunisation has been established. This had previously been demonstrated by Pasteur in the case of anthrax and other diseases. Behring, however, went further and found that the blood serum of the protected animal was capable of affording immunity to another animal, and finally, by experiment, he proved that the serum was *curative* when administered to an animal already poisoned by the original virus or its chemical poison. Upon such experimental data is founded the new Serum Therapy of diphtheria, tetanus, snake bite, &c. The animal immunised against enormous lethal doses of the poison is bled, and the strength of the serum is determined so as to provide for suitable dosage.

Behring's method of determining the antitoxic value of serums is to mix them in varying quantities with ten lethal doses of toxin, and then to administer the mixture to guinea-pigs of 300 grammes weight. When he found a serum of which 0·1 c.cm. mixed with ten lethal doses could be injected into a guinea-pig without the slightest harm he labelled this serum as possessing *one immunising unit.*

He was able to protect animals to such a degree against diphtheria that $\frac{1}{15000}$ part of 1 c.cm. (=nearly $\frac{1}{1000}$ part of a drop) of their serum mixed with a fatal dose of diphtheritic toxin, when injected into a guinea-pig, produced no effects whatever. The same dose without the serum always killed the control animal.

Klein, commenting upon these marvellous results, states—"I venture to say that nothing can be found in the whole range of experimental pathology or pharmacology which offers clearer or more striking results than these experiments."

Ehrlich's unit is somewhat different, and permits of the serum being more concentrated.

The student will observe that the dosage of the serum is thus settled by its strength and not by its bulk. One sample may differ from another, but the requisite number of immunising units must be administered regardless of the bulk of the dose. 1,500 to 2,000 units are administered in severe cases to patients of all ages from infancy to adolescence, and this dose may be repeated every 8 or 12 hours. The various serums, dried or liquid, should state on the label the number of units contained in the bottle, and no serum should be used which does not bear this information. Experimental results prove that the efficacy of the antitoxin depends upon the shortness of the time between the administration of the poison and the remedy. When the poison has been forming in the throat of a patient, and absorption has been going on for days, enormously more serum is required than if the injection had been resorted to upon the first appearance of the membrane. Hence the great increase in the mortality of serum cases where delay in injecting has been marked, and it must not be forgotten that the treatment has its limits, and the antitoxin may be useless when administered in almost any reasonable amount in cases where the system has been long saturated with the poison before the remedy is used. But as it is perfectly harmless it should always get a trial, even in the worst and most delayed cases. The mortality of diphtheria has fallen to about half what it was before the serum treatment, judging from the statistics of all countries, though the fall is much less in England than upon the Continent and in America, and it is a significant fact that the mortality is lowest where the dosage is largest, and where the treatment is resorted to early.

After a full dose (1,500 or 2,000 units) the membrane ceases to grow and soon disintegrates, and general improvement rapidly sets in. Laryngeal cases require larger doses. Antiseptic precautions should always be taken, and the abdomen or flank or back affords the best site. The liquid serums are to be preferred to the dry preparations.

The serum is protective, but the protection lasts only a short time; nevertheless, recent reports prove that injections of 200 units in schools and dormitories give excellent results in outbreaks of the disease. (See the serum treatment described at greater length in the Author's "Dictionary of Treatment," pages 216–219, 3rd edition.

Belfanti extols an injection of 5 c.c. hypodermically in all cases of *ozæna*, and numerous reports of the good effects of injections in asthma, typhoid fever, and phthisis have been published.

Antitetanic Serum, prepared upon the same principles for tetanus, has now been extensively tried. Experimental evidence proves its wonderful efficacy, but in practice the results are disappointing, owing to the fact that the microbe has been manufacturing and discharging its virulent poison into the system for a long time before the symptoms give any warning of the disease, and then it is either too late to administer the drug, or it will require enormous amounts of the serum to be of any use. Statistics are not yet sufficiently numerous for safe conclusions, but the serum should always be used, and that of Tizzoni is best.

There is little good to be expected from less than 100 c.c. of serum, and the results are more hopeful in those cases where the symptoms do not come on abruptly. Local treatment, as excision of the wounded area, when possible, should be resorted to. Prophylactic treatment, by injecting a small dose after the receiving of wounds, contaminated by clay, soil, or dust, would probably be certain.

Antityphoid Serum—This agent, as regards experimental value, is in a different position from the two previously-mentioned remedies, as less is known about the true typhoid poison, and reports of the use of the serum are still most contradictory and somewhat disappointing. Nevertheless, if the serum be administered at the very early stage of the disease, before the typhoid bacilli have had time to reach their fullest development, there is fair reason to hope better results, especially as the antityphoid serum is believed to act by its *bactericidal* and not by *antitoxic* properties. About 3 drs. of the serum may be given daily.

Antistreptococcic Serum has been reported upon most

favourably in erysipelas, surgical and puerperal septicæmia, scarlatina, &c. It resembles the last-mentioned serum in as much as its action is not strictly antitoxic but bactericidal, and the results are not to be compared with those obtained by the antidiphtheritic serum, which is a true antidote to the toxin producing the symptoms.

The writer has seen a case recently where erysipelas was conveyed to an infant a few weeks old from its mother; the symptoms of the disease were daily anticipated, and immediately upon their first appearance full doses of the dried serum were daily, and sometimes twice daily, administered without the least result in retarding a fatal issue. It seemed a typical case for trial of the efficacy of the remedy, but probably liquid serum might have given different results. 20 c.c. should be given immediately, and half this amount every 12 hours till improvement manifests itself. The serum has been reported as giving good results when used in phthisis.

Antisyphilitic, antitubercular, and antirabitic serums are being employed, but they must be regarded as still upon their trial, though Maragliano's serum has given good results in lupus. The researches of Richet, Kollman, Spiegler, Boeck, and Grosz, with syphilitic serums, prove that this method in its present condition is practically valueless. The serum treatment of hydrophobia, as at present being perfected by Tizzoni, Centanni, and Babes, promises to supersede Pasteurism.

Antivenene is a serum prepared by immunising an animal with rapidly increasing doses of snake venom. Most striking results have been demonstrated by Calmette and Fraser in their experiments. The remedy has been successfully tested for cobra bites in the human subject, and when used early in doses of 20 c.c. to 40 c.c. success is to be expected in cases of bites of all poisonous serpents. The bite of the more venomous variety of snake or serpent requires a much larger amount of the remedy, which should be injected into a vein.

Anticarcinomatous Serum has been produced by Dubois, who injected into healthy animals emulsions made from living cancerous tumours. After the appearance of cancerous tumours in these animals, their serum was obtained and injected into patients suffering from mammary and epithelial cancers, and successful results are published, the malignant growths being converted into fibrous nodules. Further reports are awaited with interest about these cases already treated as well as about others under treatment.

Under the name of Cancroine, Adamkiewicz has injected a liquid described as a secretion of the cancer parasites and allied to Neurine.

Leprosy Serum.—Carrasquilla has reported striking results in leprosy, following the injections of a serum prepared by injecting horses with the serum obtained from lepers, and Merck is now manufacturing this antitoxin, which promises to give valuable results in this terrible disease.

Apiol—A green oily liquid, the active principle of the fruit and root of parsley (apium petroselinum). It is a powerful diuretic; in large doses (1 dr.) it produces effects like quinine, ringing in the ears, headache, and vertigo. It was formerly used as an antiperiodic in ague and intermittent neuralgia. It is chiefly recommended in dysmenorrhœa and amenorrhœa, given immediately before the expected menstrual period, in capsules containing 3-5 minims. Apiol camphor in white silky crystals is given in doses of 10 grs. Apiolin is a yellow fluid obtained by saponifying apiol. It is greatly praised in 5 min. doses in capsules in all menstrual disorders in which apiol is given.

Apocynum Cannabinum—The root of American Indian hemp or Canadian hemp exerts an action upon the heart like digitalis, and is a reliable diuretic. G. Murray has shown that it resembles strophanthus more than digitalis, as it has no effect upon the arterioles. He strongly recommends it in mitral disease. It is given with advantage in dropsies of cardiac and renal origin, and its power over effusions is said to be so great that it has been called in America the "Vegetable Trocar." Dose—Of a decoction (1 to 40) 1 to 2 ozs., or of a tincture (2 ozs. to 1 pint) 10 to 40 minims, or of the liquid extract 5 minims, or of the active principle—Apocynin—as an expectorant, $\frac{1}{4}$ to $\frac{1}{2}$ gr. If given in fuller doses it is a hydragogue cathartic.

Apolysin is a yellowish-white crystalline sparingly soluble powder, closely allied in composition and action to phenacetin. The reports of those who have been using the drug show that it is harmless even when given in daily amounts of 120 grs. It does not relieve pain so promptly as phenacetin, nor can it be depended upon to reduce the temperature as speedily as antipyrine, but in every condition in which these agents have been used its utility has been demonstrated, and its harmlessness (so far as at present known) places it in the front rank of analgesics and antipyretics. It may be given in the powder form in doses of 10 to 30 grs., and is very suitable for children. It is also a powerful antiseptic.

Arbutin is the active principle of Uva Ursi. It is a glucoside introduced by Lewin, who believed that it was split up in the system—Hydrochinon appearing in the urine, which becomes brown or olive green on exposure. It is not poisonous; the hydrochinon into which it decomposes is a powerful antiseptic, even in 1 per cent. solutions. It is beneficial in chronic cystitis

and vesical catarrh arising from obstruction, &c., and in suppurative conditions of any part of the urinary tract. It may be given in the form of powder in 20 gr. doses, in water.

Arecolinæ Hydrobromas is the salt of an alkaloid obtained from areca nut. It is introduced as a substitute for eserine, and has powerful sialagogue action, and is an anthelmintic. 1 per cent. solution causes contraction of the pupil in 10 minutes, which passes away in about an hour. It has given excellent results in glaucoma where eserine has failed. It is a powerful poison, acting like muscarine when swallowed.

Tenaline is another substance prepared from areca; it is a powerful anthelmintic, and less toxic than arecoline.

Argentamin is a solution of 1 part of phosphate of silver in 1 part of ethylendiamine and 10 parts of water. It is powerfully antiseptic, and, though more efficacious than the nitrate because it penetrates deeper into the tissues, it produces less irritation owing to its alkaline reaction. It does not form deposits or discolorations upon the diseased cornea, and has been found (in 5 per cent. solutions) more satisfactory in eye work than the ordinary lunar caustic. In gonorrhœa it is much praised, injections of 1 in 4,000 speedily destroying the parasite.

Argentol is Quinaseptolate of silver—a yellow, sparingly soluble powder, which readily splits up into oxyquinoline and metallic silver. It is used as a dusting powder like iodoform and as an injection (1 in 1,000) in gonorrhœa. The Sulphophenate of silver is introduced as a substitute for the nitrate; it is more soluble than the new organic salts, and is very slightly irritating.

Argentum Colloidale is another of Credé's silver preparations. It is metallic silver in a colloid state, and in the form of Credé's ointment it is rubbed into the skin in various septic states for 20 minutes with the view of being absorbed like mercurial ointment. 45 grs. of the ointment are used in this way twice daily.

Argonin is a compound of silver with casein which possesses many of the properties of the preceding drug. It has been used successfully in 2 per cent. solution in gonorrhœa. It causes little irritation, and is powerfully antiseptic like Actol (which see).

Aristol is a brown, insoluble, unstable, odourless powder, prepared by the action of thymol upon iodides; it contains about 46 per cent. iodine. It is introduced as a substitute for iodoform, and already its literature is extensive, glowing with reports of its curative powers in every diseased condition in which iodoform has been used. In lupus it has given excellent results, but has no action upon the unbroken skin, and therefore does not affect

lupus which is not already freely ulcerating. The preliminary application of a caustic is thus necessary in all early cases. It may be dusted in powder over the lupoid ulcers, or applied as a 10 per cent. ointment, and it has been similarly applied to corneal ulcers.

In scrofuladerma, epithelioma, and all late syphilitic ulcers, it has been found efficacious, but the drug has not gained in favour, though numerous reports of its value have been published in the following conditions:—Tinea, gonorrhœa, chancres, psoriasis, eczema, ozœna, otorrhœa, rhinitis, &c. In vaginal and uterine ulcerations it may be used as a pessary. In psoriasis the best plan is to apply a 10 per cent. solution in flexible collodion, or a 10 per cent. starch paste, or a plaster (20 per cent.). For chancres and ulcers of the legs a good plan is to freely sprinkle them with a mixture of equal parts of aristol and oxide of zinc or prepared calamine.

The iodides of diiodophenol, diiodoresorcin, diiodosalicylic acid, and of cresol are also brown powders which are being used as antiseptics.

Asaprol is a soluble white powder, obtained by acting on beta-naphthol with sulphuric acid and adding calcium carbonate. It possesses the properties of the salicylates, and relieves pain and reduces fever heat, and has been much used in France in cases where antipyrine and phenacetin are indicated, especially in rheumatism, influenza, and neuralgias. It is a powerful antiseptic, and has been given in painful dyspepsia in doses of 5 to 15 grs. in solution or in powder. It has been praised as an internal remedy in hæmorrhages, and as a lotion (3 per cent.) for wounds and sore throats, and as a spray in whooping-cough. Riegler has found that asaprol is a sensitive test for albumen, albumoses, and peptones. For testing albuminous urine, 1 part of strong hydrochloric acid is added to 10 parts of a 10 per cent. watery solution of the drug, 10 drops of this solution added to 1 drachm of urine precipitates albumen, albumoses, and peptones, the ppt. of albumen does not dissolve on boiling, while the ppts. of the other substances do. The drug is incompatible with many substances as antipyrine, quinine, soluble sulphates, &c., and should be given alone.

Asclepias Tuberosa, or Pleurisy Root, is allied to A. incarnata and syriaca. It produces in ½ dr. doses of the powdered root diuretic effects, and is a good expectorant. In larger doses it is an active cathartic and emetic. It is, however, chiefly used as a diaphoretic in the early stages of fevers, and combined with more powerful expectorants in bronchial catarrhs. American physicians believe that it gives best results in pleurodynia and pneumonia.

Aseptol, or Sulpho-Carbol or Sozolic Acid, is a syrupy liquid with a faint odour like carbolic acid. It resembles in its properties both salicylic and carbolic acids. It differs from the former in being very soluble, and from the latter in being less caustic, and in being perfectly harmless. It has been consequently used in abdominal surgery in 5 per cent. solution. Annessens maintains that its antifermentive, antiputrid, and disinfectant properties are more energetic than those of salicylic and carbolic acids, and that it will advantageously replace carbolic acid. It is also known as Sulphocarbolic Acid, or Orthophenol-sulphonic Acid, but it is really only a 33 per cent. solution of this acid, prepared by the action of sulphuric upon carbolic acid. It is a delicate test for albumen and bile pigment in the urine.

Oxychinaseptol or Diaphtherin and Chinaseptol or Diaphthol are allied antiseptic and unirritating crystalline bodies. The former is used in 1 to 2 per cent. solution for burns, wounds, otorrhœa, &c. It is especially valuable for washing out cavities, but it blackens nickel and silver instruments.

Asparagin. (See under Althæa, page 493.)

Aspidospermine is an active principle of Quebracho Bark, which has been used in cardiac asthma and in all varieties of dyspnœa. It is a powerful drug and must be used with caution. The dose is $\frac{1}{4}$ gr., but it is advisable to employ a liquid preparation of the bark, owing to the difficulties in obtaining the alkaloid in a pure state. By reducing the irritability of the respiratory centre it proves beneficial in relieving dyspnœa depending upon disorders of the circulation, or diseases of the heart. Da Costa gives 20 minim doses of the liquid extract every hour in the asthma arising from failure of cardiac contraction ; the pulse is reduced 20 beats without any alteration in the arterial pressure. It has been given in pulmonary emphysema with advantage, and in spasmodic croup. Large doses of aspidospermine have a marked antipyretic action. Hydrochlorate of Quebrachine has been given hypodermically and by mouth, in doses of 1 gr. It acts as an emetic, like apomorphine, speedily and energetically.

Commercial Aspidospermine is a mixture of six alkaloids found in the bark.

Auri et Sodii Chloridum is an orange-yellow deliquescent powder, which has been found to give results superior to the salts of silver in various nervous diseases. Small doses ($\frac{1}{25}$ gr.) increase the appetite and promote constructive metamorphosis; larger doses, according to Bartholow, increase waste—the tissue yielding most readily being the connective, especially that of pathological formation—hence its usefulness in sclerosis, and he affirms that it has cured posterior spinal sclerosis and interstitial

nephritis. Results which appear to warrant confidence in this drug have been obtained in hystero-epilepsy, melancholia, sexual debility, nerve diseases characterised by spasm, as laryngismus, asthma, chorea, in cirrhosis of the liver and lung, amenorrhœa, &c., and in various ovarian and uterine affections. In tertiary syphilis it seems to act like the chloride of mercury. In concentrated form it acts as a caustic. Dose—$\frac{1}{20}$ to $\frac{1}{10}$ gr., in pill or dissolved in water, twice daily.

Wood reports most favourably of gold with bromide of arsenic in the neurotic diseases of old age.

Baptisin is the impure resin extracted from the root of the wild indigo, which is one of the eclectic remedies. In the form of powder—1 to 5 grs. in pill—it has been found to cause vomiting and purging. It is believed to be an hepatic and intestinal stimulant of considerable power, it has been useful in amenorrhœa and in low typhoid states, and as a local stimulating alterative to fetid gangrenous sores.

Barium—The observations of various writers have proved that salts of barium have very decided action upon the heart and vessels and muscles. Dr. Bary finds that these salts act upon the heart like digitalis in nearly every respect. Their action also resembles, in some degree, that of physostigmine. Injected into the veins they, like pilocarpine, greatly stimulate the salivary glands. The blood pressure is increased, and there is marked contraction of the blood vessels. The chloride was the salt experimented with. There is yet no accurate data to guide one in determining the dose. Shoemaker mentions a case where death followed the administration of $2\frac{1}{2}$ grs., in daily doses of only $\frac{1}{4}$ gr. The sulphide has been given in doses of $\frac{1}{2}$ gr. in keratine pills. Recently the drug has been freely given for colic in horses with success.

Basham's Mixture is the Mist. Ferri et Amm. Acet. U.S.P. It consists of tincture of chloride of iron 2 parts, diluted acetic acid 3 parts, solution of acetate of ammonium 20 parts, elixir of orange 10 parts, syrup 15 parts, and water 50 parts—a valuable method by which the diuretic and astringent qualities of iron may be obtained. Dose—one table-spoonful thrice daily. It has been a prized combination in this country, generally extemporised by prescribing the tincture of perchloride of iron and Mindererus spirit in a mixture.

Benzacetin, or Phenacetin Carbonic Acid, in needle-shaped crystals, acts like phenacetin ; its third name, Acetamidosalicylic Acid, gives a good idea of its therapeutic virtues, and it is used in neuralgias with much benefit in doses of 10 grains, with or without caffeine. It is credited with hypnotic properties and may be given at bed-time in doses of 20 grs.

Benzin, or Petroleum Ether U.S.P., is a transparent colourless inflammable liquid distilled from American petroleum. It has been used in 30 min. doses as an anthelmintic for tape-worm, and as a remedy when mixed with lard or oil for the itching of painful skin affections, and as a counter-irritant like turpentine when applied undiluted.

Benzo-iodo-hydrine is a brown substance prepared from benzoyl-iodide, introduced as a substitute for iodide of potassium. Its composition is seen by its proper name—benzo-chlorhydro-iodhydrin, and its dose is only 1 grain. It should be prescribed with sugar, and it is claimed for it that when in the blood it parts with its iodine very slowly.

Benzosol, or Benzoyl-guaiacol, is a white crystalline insoluble powder, without odour, prepared from a potassium salt of guaiacol and benzoyl chloride. It contains over 50 per cent. guaiacol, which is supposed to be set free in the intestines. It has been introduced as a palatable form in which to administer guaiacol in phthisis, in which disease it has been given in 5 grain doses 4 or 6 times a day, with marked benefit, mixed in sugar or chocolate. It does not appear to possess any advantage over guaiacol, save in being less nauseous, and it is not likely to come into very general use owing to the difficulty in producing it in a pure and uniform condition.

Benzoyl-Anilid, or Benzanilid, is a colourless compound in scaly crystals, closely allied to antifebrin, obtained by boiling benzoic acid and aniline. It has been given as an antipyretic to children, in doses of 3 to 8 grs., but as the newer antipyretics have come into general use it is now seldom employed. Kahn has obtained excellent results from it in pneumonia, meningitis, and phthisis in children.

Benzoyl-Eugenol, or Benzoeugenol, is the benzoic ether of eugenol. (Eugenol is an oxidation product of oil of cloves.) It exists in colourless, inodorous crystals, which are bitter and only slightly soluble in water. It is suggested as a substitute for creosote and guaiacol in the treatment of pulmonary phthisis, and it has been injected in this disease in 10 per cent. solution in sterilized olive oil. Owing to its less objectionable taste it is preferred to both eugenol and guaiacol. It is given in the same doses as these drugs.

Benzoyl-Naphthol, or Benzonaphthol, is a colourless, tasteless, and almost odourless crystalline powder, obtained by acting on benzoyl chloride by beta-naphthol. It is used as an antiseptic, and when given internally it acts like most of the naphthol compounds as a disinfectant to the stomach and intestinal tract, the naphthol exerting its local action, whilst the benzoic acid is excreted as hippuric and acts as a diuretic. It has been used in

typhoid fever and infant cholera. In doses of 6 grs., in tabloid form, to be given every 3 or 4 hours.

Lactol is identical in action, but more soluble. It is the lactate of beta-naphthol.

Benzoyl Pseudo-Tropeine. (See under Cocaine Salts.)

Berberis Aquifolium, or Holly-leaved Barberry root, has been extensively tried in America made into a tincture (1 to 5). It is said to be an alterative and tonic in 20 minim doses, and has been reported useful in various forms of syphilis and struma. It also possesses antiperiodic powers, and has been recommended in malaria and the vomiting of pregnancy in the form of the alkaloid—Berberine 5 grs. *ter in die.*

Betol is a body in small white tasteless crystals analogous to salol only having the base of naphthol. It splits up in the body into salicylic acid and naphthol. Kobert and Sahli have given it in rheumatism and cystitis, and often with great benefit; both sometimes, found it to fail when least expected. Kobert, however, affirms that it is preferable to salol in rheumatism; it may be given in doses of 10 to 15 grs. every 6 hours. It contains 10 per cent. less salicylic acid than salol. It is also known as Naphthalol, Naphthosalol, and Salinaphthol; according to Helbing it seems to be entirely forgotten owing to its insolubility and chemical stability.

Alphol is the corresponding salicylate of a-naphthol, and resembles salol in its action and dosage.

Bile Salts, Taurocholate and Glycocholate of Sodium, are extracted from ox-bile, and have been used with success by Granville in gouty obesity and dyspepsia. Recent researches have proved that these salts are cardiac tonics acting like digitalis, but without raising the blood pressure. Stadelmann has demonstrated that they possess surprising cholagogue action, and in animals he raised the quantity of bile excreted by 120 per cent. by administering these salts. The glycocholate is preferred, and it may be given in doses of 10 to 15 grs. in pills coated with keratine in gall stone cases and in fatty or amyloid liver, and Phisalix states that it is a chemical vaccine against viper poison.

Bismal, or Bismuth Methylendigallate, is used where the insoluble bismuth preparations are indicated, as in gastric ulceration and intestinal irritation. It is, moreover, markedly astringent, and has proved of much use in the diarrhœa of intestinal ulceration in doses of 15 grs. 3 or 4 times a day. Sprinkled over ulcers and intertrigoes its antiseptic and astringent qualities are already well recognised.

Bismuth Salts—The following salts of bismuth have been lately tried in medicine and surgery.

The Soluble Phosphate is used in acute gastric and intestinal catarrh in doses of 5 grs. dissolved in 3j. water. It has also been applied to wounds.

The Sulphite, a white powder soluble in acids, which gives off sulphurous acid in the stomach, has been recommended in fermentative states of this organ in doses of 5—15 grs.

The Oxyiodide is a red, heavy, insoluble powder used as a substitute for iodoform.

Of organic salts of bismuth there seems to be no end.

The Beta-naphtholate, or Orphol, and the Carbolate are insoluble powders, which split up slowly in the digestive canal, and the phenols act as disinfectants. They may be given in tuberculosis, cholera, and diarrhœa, in doses of 10 to 20 grs. Orphol is highly recommended by Chaumier in typhoid and the diarrhœa of children.

The Naphthalin-benzoate or Intestin has similar properties.

The Benzoate is used as a stimulating powder for chancres and ulcers, and also for internal use.

The Tribromcarbolate or Tribromphenolate, also called Xeroform, is a yellow powder strongly recommended by Hueppe as a specific against cholera, in doses of 8 grs. every two hours. It is one of the best of intestinal antiseptics, and is also recommended as an application to wounds, burns, and ulcers, as a substitute for iodoform, in the form of a dusting powder, and it may be used in eczema.

The Lactate has been given in 15 gr. doses in gastrodynia and colic.

The Oleate is a bland, unirritating emollient used in intertrigo, &c.

The Pyrogallate is used in skin therapeutics; it differs from the other bismuth antiseptics in being soluble in alkaline secretions. It is also known as Helcosol.

The Subgallate is described under Dermatol on page 527.

The Gallate of the subiodide is described under Airol on page 492.

Loretinate of Bismuth is used by Nicati as a dusting powder in eye cases instead of calomel; it is dusted on ulcers and wounds like iodoform, and has been administered internally in the diarrhœa of phthisis in 8 gr. doses. (See also Loretin.)

The so-called Chrysophanate or Dermol is, according to Merck, a mixture of impure chrysarobin and a salt of bismuth.

The Basic Dithiosalicylate, under the name of Thioform, is a light, yellowish, grey, insoluble powder, which has, upon the testimony of Hoffmann and a number of observers, given most satisfactory results as a substitute for iodoform in almost every variety of ulcer and wound, including burns, in erysipelas, eczema, otitis, and dusted into the eye, ear, and throat in various

diseased conditions. It is also an efficient intestinal antiseptic, and has given good results in diarrhœa, &c., in doses of 6 grs. *ter die.* The Basic Salicylate is now in the B.P.; it may be used as a substitute for iodoform.

The Sodium-phospho-salicylate is a white powder used as an iodoform substitute mixed with talc (1 in 5). It is also given internally in solution. It is known as Bismuthol.

The Peptonate is a brown powder, claimed to be the most easily assimilable of the bismuth preparations; it contains only $3\frac{1}{2}$ per cent. of the oxide, and may be given in tea-spoonful doses.

The Albuminate contains three times the amount of bismuth contained in the Peptonate, and is given in intestinal affections in 30 gr. doses.

The Resorcinate is a yellowish powder, introduced as an iodoform substitute.

The bismuth salt of Nosophen is described under Eudoxin.

Blatta Orientalis—Cockroaches have been used by the Russian peasants for centuries as a remedy for dropsy; when given in the form of powder, infusion, or tincture, they greatly increase the quantity of urine, diminish the amount of albumen, and rapidly reduce anasarca and ascites. Their virtues depend on *blattic acid*, which forms soluble salts with potassium and sodium. These salts were found to be powerful diuretics, acting by exciting the secretory elements of the kidney. They slow the pulse in small doses and accelerate it in large doses, and cause falling of the blood pressure and paralysis of the cardiac muscle. Bogomolow named the active principle Antihydropin. He gave the powdered beetles in 4 to 5 gr. doses to children thrice daily.

Boldoa Fragrans—The leaves of the boldo tree, a native of Chili, are used as substitutes for quinine. Dose—10 to 20 minims of a tincture (1 to 8) in dyspepsia, atony of the bladder, cystitis, gonorrhœa, Bright's disease, rheumatism, and cirrhosis of the liver.

A glucoside, Boldo-glucin, has been isolated from the leaves; it has been given for liver diseases, bladder affections, and gall stones in 3 gr. doses in capsules and by the rectum as an hypnotic. The alkaloid, Boldin, is given as an hypnotic in doses of $\frac{1}{12}$ gr.

Bone Marrow (Red). (See Medulla Ossium.)

Boral. (See under Aluminium.)

Boroglyceride. (See under Acid. Boric., page 307.)

Borol is a boron compound (SO_2,OBo,OK or Na) introduced by Jäger. It is a soluble, colourless, odourless, vitreous solid, with powerful antiseptic properties, being stated to be three times

stronger than carbolic acid, and free from any irritating qualities when administered internally. 1 per cent. solution has been successfully employed in diphtheria, gonorrhœa, and ozœna. Internally, 3 to 6 grs. may be dissolved in 1 dr. of water and administered every 4 hours in erysipelas and all septic conditions. It probably will be found useful in bladder diseases.

Brain Matter and Spinal Cord have been recently introduced in the mania for animal extracts, which has developed since the discovery of the wonderful virtues of thyroid gland preparations in myxœdema and cretinism.

Under the name Cerebrinin, a preparation obtained from the grey matter of the sheep's brain has been used in hysteria, melancholia, nearly every form of neurosis, chronic alcoholism, and imbecility. At present the results are apparently not such as to justify the use of the agent in these diseases, though it does not appear that in 5 to 10 gr. doses any untoward effects have been noticed.

Nearly the same remarks apply to Spinal Cord substance.

That these agents are not, however, absolutely inert is proven by the recent interesting results obtained by Wassermann and Takaki, who have demonstrated that an emulsion prepared from the normal brain and cord has the power of conferring immunity from tetanus. These organs possess a distinct antitoxic property which is absent in other organs.

1 c.c. brain substance they found was able to save an animal from 10 lethal doses of tetanus poison. These observers believe that Ehrlich's view is thus proven, viz.—That the tetanus poison combines with the cells of the spinal cord and brain.

Brenzcaine is Guaiacol-benzol-ether, a crystalline compound used by Marcus for producing local anæsthesia by the new cataphoretic method, the drug is dissolved in vasogen and applied by means of the electric current. It is also suggested as a remedy for tuberculosis.

Bromalin or Bromethylformin is a crystalline powder, containing about half the amount of bromine present in KBr. It was introduced by Bardet as a substitute for this drug in epilepsy and other spasmodic affections. It is given in solution in water, or in capsules in twice the amount of the alkaline bromides, and it is claimed for it that the ordinary drawbacks—rash, fetor, and anorexia—do not occur, and the results are reported as most satisfactory. Merck gave the name of Bromalin to it, and it is not to be confounded with Bromelin.

Bromamid is a crystalline, tasteless, insoluble salt, being the hydrobromide of tribromaniline. It is introduced as a remedy for neuralgia, and as an antipyretic in acute rheumatism, in doses of 10 grs. every 3 or 4 hours, in cachets.

Bromelin is the name given to a new digestive ferment obtained from the pine apple. It converts proteids into peptones in acid, alkaline, or neutral solutions as papain does, and it promises to be useful in gastric complaints where pepsin or papain is indicated, but accurate data for dosage are not forthcoming. It is not to be confounded with Bromalin.

Bromipin is a yellow, oily liquid obtained by adding 1 part of bromine to 9 of sesame oil. It is introduced by Winternitz as a substitute for the ordinary bromine salts in chorea and epilepsy, in drachm doses.

Bromoform is a colourless, sweet-tasted liquid, analogous to chloroform, which has been used as a general anæsthetic, but its use is attended with such dangers and drawbacks that it should not be used for this purpose.

It has been found to control the violence of the spasms of whooping-cough, and has given excellent results in this disease in doses of 2 to 5 mins. ($\frac{1}{2}$ a minim may be given every hour to a child 1 year old), in water and tincture of orange. Stepp highly recommends it in this disease, and advises that it be given dropped into a spoonful of water, in which it sinks like a button.

Externally the liquid has been painted over painful spots, and applied to the larynx.

Bromo-Hæmol is a compound of bromine with hæmoglobin, and is introduced as a substitute for the inorganic salts of bromine. As it contains less than 3 per cent. of this element, it must be given for long periods and in much larger doses (15 to 30 grs. in wafer) more frequently. It is indicated in hysterical affections in anæmic subjects.

Bromol, or Tribromphenol, is a white, crystalline, insoluble salt, prepared by agitating a solution of carbolic acid with bromine water. It was introduced by Grimm as a powerful antiseptic, and it was found that a 2 per cent. gauze when soaked in the oozing from recent wounds kept quite fresh for a fortnight. An ointment, 1 dr. to 1 oz., and a solution, 1 dr. in 4 ozs. olive oil, have been used as dressings. The drug has been sprinkled in fine powder on sluggish ulcers and wounds. A solution of 1 dr. in 3 ozs. glycerin has been used as a swab in diphtheria.

Given internally in doses of $\frac{1}{2}$ to $1\frac{1}{2}$ grs. it passes unaltered through the stomach, and, reaching the alkaline secretions in the duodenum, it is dissolved and absorbed, and finally excreted by the kidney as tribromphenol-sulphuric acid. It has been given in doses of $\frac{1}{2}$ gr. as an intestinal disinfectant in typhoid fever and diarrhœa. It is not to be confounded with Bromal, an oily liquid allied to Chloral.

Bromo-Phenol. (See under Ortho-m-phenol.)

Brucine is an alkaloid in small whitish, bitter, acicular crystals, obtained from nux vomica. In physiological and therapeutic action it closely resembles strychnine (only it is considerably weaker, and is eliminated with much greater rapidity). It increases very markedly the reflex activity of the spinal centres. (See Nux Vomica in the Therapeutic section of this work.) It has been recommended in epilepsy, in doses beginning with $\frac{1}{20}$ grain, gradually increased to $\frac{1}{2}$ grain, in solution in water and a little spirit.

Bryonia—The fresh and dried roots of Byronia alba and Byronia dioïca are used in medicine. It is a hydragogue cathartic of dangerous power, and is given in dropsies. The fresh leaves will produce vesication, and have been used as counter-irritants.

Bryony is believed to have a powerful effect in controlling *inflammations of serous membranes*. 1—10 minims (B.P.C. Tincture) have been given with or without aconite in acute pleurisy with much benefit. In acute rheumatism, combined with salicylic acid, or alone, it has produced good results. It may be given where aconite is indicated in acute febrile conditions. An infusion, 1 in 10, has been found to possess strong styptic properties.

Bryonin is the glucoside of bryony, and in large doses purges freely. $\frac{1}{50}$ gr. may be given every 2 or 3 hours till purgation occurs, then $\frac{1}{100}$ gr. every 6 hours as long as the serous inflammation lasts.

Cactus Grandiflorus—The flowers and fleshy branches of this plant made into a tincture have been found to produce remarkable action upon the heart. In painful palpitation from functional causes it has been stated by Cullen and others to give great relief. Other observers state that it has cardiac tonic properties and diuretic powers like digitalis, and it has been administered in angina and valvular lesions with benefit in doses of 5 to 10 minims of the fluid extract. The tincture (1 in 5) is given in doses of 5 to 20 minims. It has also been recommended in exophthalmic goitre. Some authorities deny that this drug possesses any cardiac tonic properties.

Cæsium and Rubidium—The bromides of these rare metals have been used in epilepsy and painful cardiac palpitation in 5 gr. doses. Botkin has published the results of a series of experiments made with the chlorides of these metals, his results in the main agree with those of Ringer. The pulse is slowed and strengthened and the arterial pressure raised. The pneumogastric centre and the peripheral inhibitory apparatus of the heart are stimulated. In other respects there is a close resemblance between their action and that of potash salts. 5 grs. may be given in water every 4 or 6 hours.

The bromide of cæsium and ammonium, and the bromide of cæsium rubidium and ammonium have been highly recommended in epilepsy and insomnia in similar doses to the soda salt.

Calcii Pentasulphidi Liquor, or Vlemingkx's Solution, is mentioned under Sulphur, page 475. It is not official.

Calcii Permanganas is a salt closely resembling permanganate of potassium. It has been used in solution under the name of Monol to purify drinking water in France. It is claimed for this salt that it is 100 times more powerful in its antiseptic and bactericidal action than the potassium compound. A solution of 1 in 1,000 is used for disinfecting instruments, 1 in 300 for the surgeon's hands, 1 in 500 for the vagina, uterus, and urethra.

Calcium Borate is a white insoluble powder administered internally in diarrhœa in 10 to 15 gr. doses, and used as a dusting powder in skin diseases, and as an ointment for burns and gangrenous ulcers and sloughing wounds.

Calcium Carbide is a greyish black solid substance which has been introduced as an agent for the production of acetylene gas in the treatment of cancer. When applied to ulcerating growths it is claimed for it that the lime acts as a caustic, and the acetylene gas checks hæmorrhage.

Camphoid is a substitute for collodion, introduced by Martindale. It is prepared by dissolving pyroxylin in 20 times its weight of absolute alcohol and of camphor, and may be made the medium for the local use of iodoform, chrysarobin, &c.

Camphor Naphthol is prepared by heating 1 part of beta-naphthol with 2 parts of camphor. It is used in tinea and other parasitic skin affections. Phenol Camphor is made of different strengths, and is used for similar purposes. 1 of camphor in 3 of carbolic acid is the usual proportion.

Camphor Salol is an oily liquid, prepared by fusing 3 parts of salol with 2 of camphor. It is used as an application in tinea, and on wool for suppurative conditions of the middle ear.

Camphora Monobromata exists in long acicular crystals in which bromine replaces an atom of the hydrogen of camphor. In large doses it produces great muscular prostration, convulsions, reduction of temperature and pulse, slowing of the respiration, coma, and death. In medicinal doses (5 to 10 grs.) it has been used in delirium tremens, epilepsy, hysteria, chorea, neuralgia, pertussis, and asthma; not with sufficiently good results to warrant its use when better known available remedies are at hand. Wood has seen it do good in spermatorrhœa. It is an hypnotic of no mean power. The drawbacks to its use are its unpleasant taste and smell, its irritative effect upon the stomach,

and the local irritation following after hypodermic injection. It is best given in the form of pill or capsule.

Camphoric Acid. (See Acid. Camphoric.)

Canadol is a colourless, very volatile liquid obtained from naphtha. It has been introduced in Russia as a cheap and efficient substitute for ether in producing local anæsthesia, and with the ordinary Richardson's spray apparatus Studensky has demonstrated that in some respects it is better, especially in the certainty and rapidity of its action, complete congelation of the tissues being sometimes produced in 45 seconds.

Cannabin Tannas is a yellowish powder obtained from Indian hemp, and free from the poisonous volatile oils. Fronmüller has found it "a useful hypnotic, powerful without being dangerous, and one which does not disturb the secretions or leave unpleasant toxic after effects if given in proper dose." Dose—5 grs. in powder; for insomnia it may be increased to 15 grs.

Occasionally, good results have followed its administration in acute mania. Wood has found it to be inert, and the reports are contradictory, perhaps from the varying purity of the samples of the drug experimented with.

Cannabine is a syrupy liquid alkaloid, and has been administered as an hypnotic in doses of 3 minims.

Cannabinol is a stable resinous substance extracted from Indian hemp. It is of complex constitution, into which the hydroxyl group enters. 2 grs. produce active intoxication, and it has been recommended and successfully employed in $\frac{1}{2}$ gr. doses in neuralgia and migraine.

Cannabinon is a purified resin obtained from Indian hemp, and has been recently tried by Richter and others; though much more certain and powerful than the previous drug, it, too, occasionally proves inert. It has been given with good results in the sleeplessness of mania in doses of $\frac{1}{2}$—$1\frac{1}{2}$ grs.

Cantharidin occurs in flat, glistening crystals; and Dietrich advocates the abandonment of all other preparations of cantharides for solutions of various strengths in formic acid, turpentine, oils, collodion, lard, &c. 1 in 300, or about 1 gr. in 5 drs., will cause vesication. It is a terrible poison. Liebreich introduced cantharidinate of potassium as a remedy in *tuberculosis*, but it cannot be said to have justified the hopes of its introducer. (See under Cantharides on page 352).

Recently an attempt is being made to revive this treatment, but Liebreich advises pure cantharidin, which is to be taken internally and not injected. He gives it for lupus and pityriasis rubra in doses of $\frac{1}{1000}$ grain in pill (fasting) daily.

Capsella Bursapastoris is known as "Shepherd's Purse." This plant has been long used, as the puff-ball was, as a domestic remedy for hæmorrhage. Bomelon has investigated its properties, and finds an active principle which he calls Bursin. He recommends the fluid extract of the plant (1 in 1) in doses of 1—2 drs. as a substitute for ergot in hæmorrhages. Bursin has been injected hypodermically as a substitute for ergot.

Carbonic Acid Gas—Dupont has found decided effects in pulmonary diseases from inhalations of this gas; it is probably rectal injections of H_2S. In phthisis, asthma, and bronchitis, he owing to the CO_2 that any good results have been obtained by administers daily 150 litres of a mixture of 1 part of CO_2 and 3 of oxygen, and claims for it power of destroying bacilli, easing pain, and reducing temperature. Schott, in heart diseases, uses an artificial Nauheim bath (60 gallons) consisting of $1\frac{1}{2}$ lbs. of chloride of sodium, $\frac{1}{2}$ lb. of chloride of calcium; the CO_2 being supplied by adding $2\frac{1}{4}$ lbs. of bicarbonate of soda and $2\frac{1}{4}$ lbs. hydrochloric acid. Bergen, who introduced the rectal administration of sulphuretted hydrogen gas, has advocated the administration of carbonic acid gas by the same route. Some physicians have carried out this treatment by the administration of alkaline carbonates by the mouth, followed immediately afterwards by acid draughts; the CO_2 being disengaged in the stomach is excreted by the pulmonary tract, where it is supposed to act upon the bacilli. There is no evidence that any lasting benefits have resulted from this treatment.

Carbonis Detergens Liquor is a concentrated alcoholic solution of coal tar. It is now represented in the B.P. by the Liquor Picis Carbonis. (See page 437.)

Carbonis Tetrachloridum—The vapour of this colourless, mobile liquid will produce general anæsthesia, like chloroform, but its effects are very transitory, and it is seldom used except to relieve local pain and discomfort, as in hay fever, asthma, tic, &c., when the vapour may be inhaled with benefit. When applied over the seat of neuralgic nerves and pained joints it gives relief speedily. It can be applied upon lint, and covered over with thin mackintosh, or it may be sprinkled upon spongiopiline. It is seldom given internally.

Carduus Benedictus, or Blessed Thistle, resembles in some respects the following drug. There is little doubt that its virtues have been much exaggerated. It is, however, a good bitter tonic, resembling in some respects calumba and dandelion. It is much used on the Continent as a tonic and mild cholagogue in dyspepsia and in hepatic congestions in doses of 5 to 10 grs. of the extract or 1 oz. of the infusion (1 in 10).

Carduus Mariæ, or Silybum Marianum, or Mary Thistle, is an old remedy revived by Lesenevich, who found it very efficacious in hæmoptysis in 15 to 20 minim doses of the tincture of the seeds in water, every two hours. Krasnikoff has obtained very satisfactory results from this remedy in hæmoptysis where digitalis and ergot had previously been given and failed. Tripier gives it with aloes in constipation from hepatic disease in 2 gr. doses, and it has been extolled as a remedy for gall-stones.

Carlsbad Salt owes its therapeutic virtues to the chloride, sulphate and bicarbonate of sodium in its composition, and Harnack gives the following form for its *artificial* preparation :— Sodium Sulphate 10 parts, Bicarbonate 8 parts, and Chloride 4 parts. It is a mild saline purgative in dessert-spoonful doses, dissolved in a tumblerful of water, in constipation associated with diseases of the kidneys and liver, and in gout, rheumatism, &c. The natural salt is no doubt more valuable, as it contains all the constituents of the natural Carlsbad water, but the natural salt in *large* crystals, though valued most in this country, is much inferior to the *fine* crystals which are now prepared with the greatest care at the Springs, being, after their production from a concentrated solution of the natural water, submitted for long periods to an atomised spray of the natural water.

Carpaine is an alkaloid obtained from the leaves of carica papaya—the source of papain. It is a cardiac poison, in large doses paralysing the heart muscle. It acts like digitalis in valvular disease, especially it is said in aortic affections, and it acts with great rapidity when given hypodermically, as recommended by Oefele, in doses of $\frac{1}{8}$ gr., and it slows the pulse, relieves dyspnœa and increases the urine, and never causes irritation at the site of puncture. Papaw juice acts like papain as a gastric sedative and digestive.

Casca Bark, Erythrophlœum Guineense, or Sassy Bark, closely resembles digitalis in its effects. The dose is 10 minims of Brunton's tincture (1 in 10).

Sansom has employed the tincture substitutively for digitalis in a considerable number of cases, but was unable to convince himself that it has any more beneficial effect in mitral disease. Brunton has found it useful in dilated heart without valvular disease, in mitral disease, and in dropsy.

Erythrophlœine is the name given to the alkaloid of the bark ; it closely resembles digitalin. It was credited with local anæsthetic properties.

Cascara Amarga, or Honduras Bark, is the bark of a Mexican tree of the order Simarubaceæ. It has been used in America as a remedy in syphilis and as an alterative in various chronic skin affections, hepatic diseases, and nasal catarrh. Its

advocates agree about its uselessness unless tobacco and alcohol be abstained from. Dose—½ dr. of the fluid extract representing an equal weight of the bark.

Casearia Esculenta is an Indian drug of repute among the Hindus. Hooper found that the root contained cathartic acid and a large amount of tannin. It acts as a mild purgative, and has been found to possess valuable cholagogue properties. Though it has been vaunted as a specific in diabetes and numerous other diseases, it does not appear to possess any very marked action save in chronic hepatic affections, hæmorrhoids, and ascites depending upon hepatic enlargement. Dessert-spoonful doses of the liquid extract (1 in 1) may be administered.

Castanea—The leaves of the Spanish or edible chestnut have found a place in the U.S.P. The fluid extract (1 in 1) has been found to possess considerable influence over the paroxysms of whooping-cough. Its *modus operandi* is unknown, but the drug is perfectly harmless, and may be given in tea-spoonful doses.

Caulophyllin—An eclectic remedy prepared from the root of *Caulophyllum thalictroides* (U.S.P.), blue cohosh, or squaw root. It is a brownish powder, best given in form of pill, 1 to 4 grs., and is recommended as a diuretic, emmenagogue, and parturient. It has been given with some success as an anthelmintic.

Cedron—Simaba Cedron seeds have been long employed by the natives of New Granada as a febrifuge and antidote to bites of venomous animals. They contain a bitter principle which appears to have antiperiodic powers like quinine. The powdered seeds in 5 gr. doses have been given in ague, dysentery, cholera, and facial neuralgia, and have been employed in gout, and in smaller doses in atonic dyspepsia.

Cerasin is an extractive existing in the form of a brown aromatic powder, prepared by evaporating a strong tincture of Prunus Virginiana. It is also known as Prunin, and may be given in doses of 3 to 6 grs. (See Prunus Virginiana.)

Ceresin is the name given to a firm white hydrocarbon, which is prepared from ozokerit. It is recommended as a basis for ointments and cerates.

Cetrarin—Since the authorities have removed Iceland moss from the B.P., a notice of its active principle may be inserted under Non-Official Remedies. It has been recently much praised on the Continent as a remedy in the catarrh of early phthisis, and in amenorrhœa and chlorosis; in the latter case mixed with organic iron salts. Its dose is 1 to 2 grs., and it is reported that appetite improves, weight increases, and the richness of the blood becomes marked.

Chaulmoogra Oil is the solid, yellowish oil expressed from

the seeds of *Gynocardia odorata.* Its active principle, Gynocardic acid, is the most convenient form for the use of this drug. It may be given in doses commencing with 1 gr. three times a day, and may be pushed till 3 grs. three times a day are taken in capsules or pills. 5 grs. of the oil may be given in capsules. In India the oil is a fluid, but in this country it generally remains solid. It has been administered in phthisis without any benefit. The oil has been used, with some success, as an external application with friction to the chest and abdomen in phthisis, tabes mesenterica, and struma. It has been also tried in a similar manner rubbed into the skin over joints the seat of chronic rheumatism and rheumatic arthritis; also with some advantage in very chronic eczema, leprosy, lupus, and psoriasis. The best application in the various stages of leprosy is an ointment composed of one part of the oil with two of lard; though there is no evidence that this has cured the disease, it certainly, when used at the same time as the acid internally, does possess considerable power in retarding the progress of leprosy.

Checken—The leaves of Myrtus Checkan contain a volatile oil and a volatile alkaloid combined with an organic acid. They have been found by Murrell, Dessauer, Holmes, and others to possess valuable expectorant qualities. Tangeman compares the action of checken to that of eucalyptus. He found in chronic catarrhs that it gave tone to the relaxed mucous membrane and made the breathing freer, especially in the case of old people. He gave ½ to 1 dr. of the fluid extract every 5 hours. It has been used in diphtheria, laryngitis, dysentery, and in catarrhal conditions of the bladder; in Chili it is used in rheumatism.

Chelidonium Majus, Celandine or Swallow-Wort, belonging to the Papaveraceæ, has been long used as a local agent for the cure of warts; the yellow juice being painted over them causes their destruction. Deniseuko has reported in glowing terms of the results of the drug when given internally in various forms of cancer. About 1 dr. of the stalks should be taken daily, and 2 drs. of the extract dissolved in water should be injected every 48 hours into the tissues surrounding the tumour. Other observers report that the results are nil. The writer has a case under observation at the present time where malignant tumour of the abdomen was diagnosed by three physicians. 1 dr. doses of the liquid extract were administered, and the growth began to disappear and the patient gained in weight. He believed the case to be probably one of mistaken diagnosis, but very soon the disease progressed rapidly, and the drug proved valueless.

Chelidonine, its active principle, is given in doses of 1—3 grs.

Chian Turpentine, about which so much has been written,

is the semi-solid, oleo-resin, obtained by puncturing the trunk of *Pistacia Terebinthus*. It mainly derives its interest from the reports of its marvellous powers in the treatment of *cancer* by Clay. The writer has given it a fair trial in several cases and found no benefit whatever from it; it will soon be entirely forgotten.

Chimaphila Umbellata leaves, under the name of Pipsissewa, are strongly recommended by Wood in external scrofula. After extensive use he believes that this remedy comes near to cod-liver oil and iodine; his opinion is supported by that of many others who state that it is not only an astringent but a valuable alterative and tonic. It has an action on the bladder like Uva Ursi, and has been used extensively on the Continent in dropsy, albuminuria, cystitis, and gleet, in doses of 1 dr. of the liquid extract (1 in 1).

Chinolinum is an oily liquid derived from quinine. It is artificially prepared by heating nitro-benzene, aniline, and glycerin, with strong sulphuric acid. It is a powerful antiseptic, and, before the discovery of antipyrine, was tried as an antipyretic and as a pigment in diphtheria. Its smell, taste, and irritating qualities are barriers to its use. The Tartrate is soluble, and may be given in doses of 5 to 20 grs. in water in ague and neuralgia. The salicylate may be used in similar doses. These salts have been used locally in dilute solutions (1 in 100) as antiseptics in gonorrhœa and other affections.

Chinosol, or **Quinosol,** is the oxyquinolinesulphate of potash, which, as a yellow soluble powder, was introduced as a disinfectant for the hands in surgical and gynæcological practice (3 per cent. solution) as a substitute for hyd. perchlor. It is a powerful germ destroyer, but it irritates fresh wounds. Recent results prove that, even in dilute solutions, it prevents the growth of various micro-organisms, but it has nevertheless not gained in favour. Mixed with five times its weight of boric acid, it has been used as a substitute for iodoform.

Chloralamide, or Chloral Formamide, is an hypnotic in colourless crystals, which are slightly bitter, soluble in water, and incompatible with alkalies. It was introduced as a substitute for chloral hydrate, and it was claimed for it that it was more pleasant to take, and possessed no objectionable cardiac depressent action. Its hypnotic power is estimated as about ⅔ that of chloral. It has been given in doses ranging from 25 to 60 grs. dissolved in water. It acts well in simple insomnia, but generally fails in moderate doses when pain and excitement are present.

It is stated that it does not tend to form a habit like chloral, but this statement is probably premature. Charteris obtained

good effects from it in sea-sickness, and it has been used in whooping-cough, chorea, epilepsy, &c. Upon the whole it has failed to realise the high expectations raised by the glowing reports of its first patrons. Under the name of Chlorobrom it has been recommended in 15 gr. doses with 15 grs. bromide of potassium in sea-sickness and insomnia, and as a gastric sedative.

Chloral Antipyrine. (See Hypnal.)

Chloralimide is a newer hypnotic, differing in chemical constitution from Chloralamide. It is prepared by the action of heat upon chloral ammonium. It exists in colourless, tasteless, odourless crystals, insoluble in water but soluble in spirit. It is stable, and is reported to be more efficacious than chloral or chloralamide. Choay claims for it properties which these substances are devoid of in safe doses; thus he states that in doses of 5 to 8 grs. it is analgesic and antipyretic to a remarkable degree. It does not possess any marked superiority over chloral when given in similar doses as an hypnotic, and it will soon be forgotten.

Chloralose is a new hypnotic in colourless needles, obtained by the action of chloral on glucose. Introduced a few years ago by Hanriot and Richet it has already formed a most voluminous literature of its own. Like all the chloral compounds, it was heralded in as a perfectly safe and harmless substitute for this dangerous hypnotic; experience has proved that it is a powerful hypnotic in doses of 4 to 10 grains given in cachet (as the drug is bitter and insoluble), but already many untoward effects are recorded, though these were absent in the experience of some physicians who gave 30 grs. It causes deep sleep, coming on in a few minutes, sometimes preceded by excitement and visual disorders and marked muscular tremors or contractions, these latter may appear during sleep, and sometimes dilatation of pupils, great slowness of pulse, and involuntary evacuation of the bladder and bowels have been observed. It is doubtful if the drug should be given where there is organic brain or spinal disease. Epilepsy, mania, and simple insomnia seem to indicate its exhibition, but there is danger in repeating the dose as it may not be absorbed. The writer, from a study of the pharmacological and therapeutical reports, believes that if the drug should ever come into general use reports of fatal results will be as frequent as with chloral hydrate. It does not, however, disorder digestion.

Chloral Urethane. (See Ural.)

Chloroform Ammoniatum is a mixture of equal quantities of strong solution of ammonia in alcohol and chloroform, recommended by Richardson. 2 drs. put into an inhaler and breathed till chloroform narcosis is reached may be inhaled

without danger for a considerable period. In this way the temperature has been reduced 4° during 12 hours. It is thus antipyretic, anodyne, and anæsthetic, and maintains the alkalinity of the blood. He recommended its use in acute rheumatism.

Chlorphenol. (See Para-monochlorphenol.)

Chlorsalol (Para and Ortho) is a compound of chlorphenol and salicylic acid, introduced as a substitute for salol. It is claimed for these soluble crystalline salts that they act better than salol upon the urinary tract. The para salt is preferred for internal use, and the ortho may be sprinkled instead of iodoform. They may be given in the same doses as salol.

Citrophen is a white powder, being a combination of citric acid with phenetidin, acting like phenacetin. It was at first, as is always the case, urged that it was absolutely harmless, and that as an analgesic and antipyretic no danger whatever followed its use. It is certainly a most efficacious agent for relieving pain and reducing fever, but Trupeul points out that it is decomposed in the system, and that one of the products is irritating to the kidney and intestines; the dose is 8 grs. It causes considerable sweating.

Cobalto-nitrite of Potassium is prepared by adding an acidulated solution of a cobalt salt to a solution of nitrite of potassium. The resulting salt is more stable, less soluble, and more uniform and purer than the other nitrites. Given in doses of ½ gr. every two hours it acts like nitroglycerin (page 480), and may be given in every case where it or nitrite of amyl is indicated, viz.—angina pectoris, uræmia, high arterial tension from whatever cause, and in asthma. The action of the drug is apparent in 30 minutes after its administration, and it lasts for 3 hours.

Cocaine Salts—Only the pure alkaloid and the hydrochloride are official, but many other compounds are used.

The Carbolate or Phenylate is a semi-solid salt. It is claimed for it that its local action is slower and more prolonged; owing to its lesser solubility it is not absorbed so rapidly, and hence deleterious effects are not observed, and it is an antiseptic. It is used in dentistry.

The Lactate, a white semi-solid, is used by Wittzack for injection into the bladder in tubercular cystitis. He injects 1½ grs. with 6 minims lactic acid and 9 minims water into the empty bladder twice a week, having commenced at first with a watery solution of the same strength, and gradually increasing the proportion of acid.

The Borate, owing to the stability of its solution, is praised for eye surgery.

The Nitrate is selected when a cocaine salt is required in eye or urethral surgery in conjunction with nitrate of silver solution.

The Hydroiodate of Cocaine has been used by Marcus in dental surgery for producing electro-anæsthesia; and Guaiacol-cocaine, or a mixture of guaiacol and cocaine, may be applied by means of a current of 2 milliamèpres, and in a few minutes teeth can be painlessly extracted by this new cataphoresis method.

Tropa-cocaine, obtained from Java coca, is more rapid, and it is alleged more safe and less irritating in eye cases. 3 per cent. watery solution is used, and it does not dilate the pupil. It is injected in dental cases as more rapid and safe. It is more stable, and, since it has been produced synthetically, it is now to be found purer, and almost as cheap as cocaine. 1 per cent. solution causes anæsthesia in $2\frac{1}{2}$ minutes. The drug is also less poisonous than cocaine; the only drawback reported being its liability to lead to bleedings after its use. It is also known as Benzoyl-pseudotropeine hydrochlorate. It is suitable for the induction of local anæsthesia by the new infiltration method of Schleich.

The Cantharidinate is used in hypodermic doses of $\frac{1}{1000}$ gr. as a means of carrying out Liebreich's tuberculosis cure.

(See also Eucaine and Holocaine.)

Cocillana Bark is a Bolivian remedy, introduced by Rusby. Wilcox has satisfied himself of its great value in bronchial affections, where it renders the sputum less adhesive, thus facilitating expectoration and diminishing coughing. He insists upon its superiority to ipecac. and apomorphine, as its valuable expectorant powers are independent of its emetic action; it increases the appetite, and is laxative. In bronchitis 20 miniims of the liquid extract or 1 dr. of the syrup may be given.

It contains a powerful principle like emetine, which promises to be of value as an expectorant.

Cocoa-Nut has been highly recommended as an anthelmintic by Parisi, who finds that the milk and interior of one nut, if eaten early in the morning whilst fasting, will lead to the expulsion of the tape-worm if present. Purgatives are unnecessary. The remedy certainly should have a trial in every case.

Colchicine and Coniine are the active principles of colchicum and conium suitable for hypodermic injection when the actions of these drugs are indicated, the former in $\frac{1}{32}$ gr. doses in painful joint affections, chronic rheumatism, and gouty troubles; the latter in $\frac{1}{2}$ minim doses in acute mania. Success is reported in tetanus by Demme with hourly injections of $\frac{1}{10}$ gr. of Coniine Hydrobromide, and Gometz has used the same salt in tinnitus aurium in doses of $\frac{1}{32}$ gr. with much benefit. Tobias has obtained good results in gout, rheumatism, and rheumatic arthritis by doses of $\frac{1}{30}$ gr. Colchicine Salicylate.

Collinsonia Canadensis, known as stone or knob root, has been used in America for a host of ailments, though practically nothing is known of its physiological action beyond that it acts as a local and possibly a remote astringent. The dose of the root is from 15 to 60 grs.; fluid extract (1 in 1), 15 to 60 minims.

It is a sedative to the urinary mucous membrane in obstinate gonorrhœa, gleet, and in cystitis, and has been proved valuable in hæmorrhoids and in anal spasm. As an antispasmodic, it has been used in whooping-cough, chorea, and in cardiac palpitation. Externally, it is used for wounds and bruises like arnica, but it is free from the serious objections to which arnica is open.

Colloid Styptic (Richardson) — Prepared by taking a saturated solution of tannin and gun cotton in absolute alcohol and ether, and adding a few drops of tincture of benzoin.

The solution is a most valuable styptic applied to wounds with a brush or in the form of a spray.

Condurango Bark was introduced by Friedreich for cancer of the stomach, and surprising results were at first reported of its action in relieving the pain of gastric ulcer and cancer and dyspepsia. It is needless to say that it has no curative action in cancer, but it is a valuable gastric sedative in ulcer, cancer, and hæmatemesis. 30 grs. or ½ dr. of the liquid extract (1 in 1) may be given four times daily.

Convallaria Majalis, or Lily of the Valley, has been long in use by the peasants in Russia, for dropsies. It has been found to possess powers closely resembling digitalis, and it is stated that it possesses none of the objectionable qualities which render digitalis sometimes dangerous.

It has a very decided tonic influence in moderate doses over a weakened heart, and it is a powerful diuretic.

It contains two glucosides—one, *convallarin*, is a drastic purgative in large doses; the other, *convallamarin*, is a cardiac tonic. The most active preparation of the drug is an extract made from one part of the root and leaves, and three parts of the flowers and stalks; this may be given in 5 gr. doses, but the most uniform action is obtained from convallamarin, which is a whitish powder, and may be given in doses of ¼ to ¾ gr.

One grain of the dried flowers, infused in 1 oz. water, and given every four hours, is a convenient method for administration.

In valvular disease, with cardiac failure, decidedly beneficial results follow; dyspnœa and palpitation disappear, and the action of the drug is maintained for a week after its use has been suspended, the pulse becomes more regular, fuller, and somewhat slower, the urine increases in amount, and dropsy diminishes.

Ott believes it differs in its action from digitalis, by *primarily*

increasing the frequency of the heart, and by afterwards slowing it through its action on its muscular tissue.

Sansom is convinced of its power of raising the intravascular pressure, and of its increasing the force of systole, but is not yet convinced of its superiority to digitalis.

Cornutine is an amorphous brown insoluble powder. It is maintained by Kobert that it is the active alkaloid upon whose presence the action of ergot depends. The citrate is a soluble salt. It is indicated in every condition in which ergot is used. The ordinary dose is $\frac{1}{16}$ to $\frac{1}{8}$ grain by the mouth in pill. It has been extolled in menorrhagia, endometritis urethral, and vesical hæmorrhage, &c. Subcutaneously $\frac{1}{10}$ gr may be given in uterine hæmorrhage. Meisels finds that it lessens the irritability of the spinal reproductive centre, and he finds it the most efficient remedy for spermatorrhœa, $\frac{1}{20}$ gr. *ter die.*

Coronillin is a cardiac tonic, being the glucoside obtained from the seeds of coronilla scorpioides. It acts like digitalis in failing compensation, in doses of $1\frac{1}{2}$ grs. every 4 hours, and it is claimed for it that it acts with rapidity, and its action is not prolonged after stopping the last dose.

Cosaparin is a whitish, soluble, amorphous powder. It is a sulpho-derivative of antifebrin, and appears to possess all the advantages and virtues of the drug from which it is derived, without, it is stated, any of its drawbacks. Thus it is very soluble, prompt in action, and it is claimed to be non-toxic, but further reports must be forthcoming before dosage and other matters can be settled.

Cotarnine. (See Stypticin).

Coto Bark yields an active principle called Cotoin. Paracoto yields Paracotoin, which is weaker.

Albertoni found they increased the appetite and absorptive power of the intestinal surface by dilating the intestinal vessels.

Cotoin has proved very valuable in the treatment of the diarrhœa of children, and in the diarrhœa of phthisis, teething, marasmus, and intestinal catarrh, especially in the feeble-minded and insane, and in the sweating of phthisis, and it has been tried in cholera with marked success by Baelz, of Japan. It is not an astringent, and has but feeble antiseptic power, and Albertoni thinks it acts by increasing the intestinal absorption, the diminution of which is the cause of the diarrhœa. It is contra-indicated in hyperæmic states of the abdominal organs, or in hæmorrhage of the bowel, or in acute catarrhal conditions. Yeo has tried it in exophthalmic goitre. The dose is 1 to 2 grs. of cotoin and 2 to 3 grs. of paracotoin.

Coumarin is the odourous principle of the Tonquin bean; it exists in colourless crystals, and has been prepared synthetically from salicylol. Its chief use in medicine is for disguising the objectionable odour of iodoform when added in the proportion of 2 per cent.

Creolin is a dark-brown, syrupy liquid, prepared from coal tar; it contains cresols, but is free from carbolic acid. It is practically non-poisonous and non-irritating, forms an emulsion when mixed with water in small proportions, and is a most efficient antiseptic. It has been used as a substitute for carbolic acid in gynæcology and operative surgery, and has answered the expectations of its first advocates. Jessner states that as a germ destroyer a 3 per cent. solution or emulsion is quite equal to a 5 per cent. carbolic acid solution.

This solution may be used for instruments and wounds, though 1 to 2 per cent. is generally found quite sufficient. In dysentery good results have been obtained by injecting a ½ per cent. liquid to be retained for 30 minutes twice a day. The same strength has been successfully injected in cystitis, and applied to burns, wounds, and bed-sores. Half this strength (1 in 400) gives excellent results in gonorrhœa and ozœna.

It has been given internally in doses of 3 grs. (in pills) in gastric fermentation, phthisis, bronchitis, cystitis, and gonorrhœa, and as an intestinal antiseptic in enteritis.

Creosal, or Tannate of Creosote, is a brown powder which combines the action of its two constituents. It is dusted on like iodoform in nasal and throat diseases, and given internally in doses of 15 grs. in phthisis and tubercular disease of the intestine. It contains about 40 per cent. tannin.

Creosotal, or Creosote Carbonate, is a honey-like liquid obtained from pure beechwood creosote. It breaks up slowly in the intestine into creosote and CO_2. It increases markedly the appetite, and is easily swallowed, and may be given in doses of ½ to 1 dr. 4 times a day in milk, cream, or wine. It is claimed for it by Reiner and many others to be equal in every way therapeutically to pure creosote, and it has been given in phthisis with great success, and in every form of tubercle and in gastric affections.

Cresalol, or Salicylate of Cresol, exists in the forms of ortho-, meta-, and para-cresalol, which are light, crystalline powders, insoluble in water; they are powerful antiseptics. The meta-salt is used as a surgical dressing in the form of insufflation or dusting powder. According to Widmer they are all three superior to iodoform, inasmuch as they are harmless and less objectionable in their odour, and have an astringent action upon the secreting surfaces to which they are applied. The meta-salt

is the best for this purpose. The para-salt has been given internally in diarrhœa and typhoid fever in doses of 3 to 8 grs. as an intestinal disinfectant, preferable to salol. A gauze is used whose meshes are impregnated with this substance as a substitute for iodoform gauze.

Paracresotate of Sodium has been used in acute rheumatism as a substitute for salicylates. 30 grs. may be given in 2 ozs. water.

Cresol—The ortho-, meta-, and para-cresols are obtained from coal tar oil by fractional distillation; the mixture of the three is known as Cresylic Acid, or so-called 100 per cent. Carbolic Acid of commerce (Helbing). They are powerful germicides, and are only slightly poisonous, but, owing to the difficulty in isolating each, and owing to their insolubility, they have not come into general use in the pure state. Meta-cresol closely resembles creosote in its action. Creolin is chiefly a solution of cresols. (See also Lysol.)

Cresol Iodide is a pale yellow powder, introduced as an iodoform substitute. It is a powerful antiseptic, but the sticky and resinous-like feeling which it induces in the surgeon's fingers is objectionable.

Curara, Wourara, Urari, or the South American Arrow Poison, is a dried extract, the product of various unknown plants. Strychnos and cocculus contribute to its terrible potency. Injected hypodermically or thrown direct into the blood stream, it produces profound muscular relaxation, with *slight* contractions, and if the dose be large enough, general muscular paralysis soon results and death follows from stoppage of the respiration. The heart's action persists to the end, and the centres and sensorium are unaffected, the action of the poison being upon the peripheries of the nerves. Pollitzer concludes that it acts upon the cementing substance of the nerves at the nodes of Ranvier. When swallowed, the kidneys are able to excrete it so rapidly that a large dose may produce no effect. It has been used subcutaneously in chorea, $\frac{1}{15}$ gr.; in hydrophobia and tetanus; and, it has been stated, with some success in the latter diseases.

Dose by hypodermic injection, 1—6 mins. of B.P.C. injection (1 in 12).

Böhm's Curarine is a powder free from curine, and representing the active principle of curare. It is given hypodermically in $\frac{1}{75}$—$\frac{1}{25}$ gr. doses.

Cutol. (See under Aluminium.)

Cypripedin is a dried extract of Cypripedium pubescens—known as Ladies' Slipper. It is recommended as an antispasmodic in hysteria, hypochondriasis, chorea, epilepsy, spermatorrhœa, and in amenorrhœa, given in doses of 1 to 5 grs. in pill.

Cytisine—The nitrate of cytisine, which is the alkaloid of Laburnum, has been used hypodermically by Kraepelin in migraine associated with dilatation of the vessels. In a violent case where every known remedy had failed the hypodermic injection of ·003 gramme gave immediate relief. It does harm where the migraine is associated with spasm, the remedy being a powerful vaso-constrictor. Cytisine is identical with ulexine; it cannot be given by the mouth owing to its dangerous irritant action on the stomach.

Damiana is the name given to a plant *(Turnera microphylla)* long used by the Mexicans as a powerful stimulant to the centres presiding over the reproductive functions. The leaves and flowers, with their young twigs, are the parts used in medicine as an aphrodisiac. It has been used in America with success in many forms of brain exhaustion, and want of tone in various regions of the nervous system, especially about the genito-urinary centres. It is a mild purgative, and has been given in some cases of paralysis with apparent benefit, and in sick headaches. The writer has obtained good results from it in cases of sexual debility and hypochondriasis. It is a tonic; in its action upon the appetite and mucous membrane of the stomach it resembles quinine and calumba, and it acts also as a stimulating diuretic.

Dose—1 oz. of an infusion representing ½ to 1 dr. of the leaves three times a day; or 1 dr. of the fluid extract (1 in 1).

Datura Tatula is a solanaceous plant, resembling stramonium in therapeutic action. It has been introduced as a remedy for asthma, to be smoked like stramonium, and though it may not be generally found to be more certain than this plant in its action, yet the writer has seen it give most unmistakeable relief when stramonium had completely failed after many trials; and in this case it *continued* to give relief for years.

Daturine is an alkaloid obtained from stramonium and datura tatula. It is identical with hyoscyamine, and, practically, may be regarded as possessing the same action as hyoscyamine, hyoscine, and duboisine, and to a great extent atropine. They all produce dilatation of the pupil, increase the pulse and respiration rate, and cause delirium, followed by sleep. (See Belladonna and Hyoscine.)

Dose—$\frac{1}{120}$ to $\frac{1}{80}$ gr.; 1 in 200 is used as a substitute for atropine to dilate the pupil.

Deelinæ Oleum is a highly refined petroleum, manufactured on the banks of the Dee. Roberts uses it in gouty eczema, ordinary chronic eczema, and also in the acute general variety. It is especially valuable for eczema of the anus, perineum, and labium, intertrigo, pityriasis capitis, and impetigo of the scalp in

children. After the acute stage is over it can be mixed with chloroform, oleate of zinc, &c., and can be made the basis for almost any other cutaneous remedy.

Delphinine—The alkaloid of Stavesacre has been given in $\frac{1}{4}$ gr. doses in pill in asthma, rheumatism, &c., and externally applied in the form of ointment over the course of neuralgic nerves. (See under Staphisagria in the Therapeutic section.) The Delphinium consolida, or Knight's spur, is an old Russian remedy for scrofula.

Dermatol is a fine yellow powder without odour, being non-poisonous and perfectly unirritating, and possessing astringent and antiseptic properties. It is a basic gallate of bismuth introduced by Heinz and Liebrecht. The reports of the value of this agent when used as a dry dressing instead of iodoform are surprising. Ulcers, burns, and fresh wounds heal with great rapidity, and its drying up properties have proved most valuable in weeping eczemas and intertrigo. It may be used as a dry powder, collodion, paste, ointment, or glue. It has been given internally in gastric ulcer and cancer, and is most valuable in diarrhœa, especially if tubercular, in doses of 8 grs. *ter die*. (See also under Bismal.) Dermol is the name given to bismuth chrysophanate.

Diaphtherin. (See under Aseptol.)

Diaphthol, or **Chinaseptol,** referred to under the heading Aseptol, is the aseptol of the chinolin series. It occurs in yellowish crystals, very slightly soluble in cold water. Guinard found it to be a powerful antiseptic without any irritating qualities, and he points out its superiority to salol as an agent for disinfecting the urinary tract.

Digitalin—Digitalinum was wisely omitted from the 1885 B.P. It was most variable, dangerous, and uncertain in its action. It is evident that it did not represent the active principle of the drug, since digitalis contains at least three active glucosides with different actions. The official or Galenical preparations should invariably be used in medicine, as the isolation of these active principles is as yet, even in the hands of the ablest chemists, surrounded with great difficulties. They are recommended with the view of hypodermic medication. The writer has frequently used the B.P. tincture in this manner, and it answers well. The digitalein (Schmiedeberg) is probably a mixed glucoside; it is given in doses of $\frac{1}{200}$ gr., and is uneven and uncertain.

Digitalin (Schmiedeberg), or the D. Verum (Killiani), was maintained to be the most constant and reliable of all the preparations; this is, however, denied by many. It is soluble

1 in 1,000 water, and the dose is $\frac{1}{250}$ gr. The French crystalline D. has many advocates.

It would seem from the researches of Masius that Merck's crystalline Digitoxin is the most reliable of the glucosides. It is claimed for it that it acts like digitalis leaf, and is of constant composition. It may be given in doses of $\frac{1}{250}$ gr. by the mouth, by the skin, or by the rectum, with water and dilute alcohol. Its action is not manifest for 8 or 9 hours, and the daily dose should never exceed $\frac{1}{32}$ gr.

Diiodoform, or Ethylene Periodide, is a yellow, insoluble, crystalline powder without odour, prepared by the treatment of acetylene iodide with excess of iodine. It contains 95·5 per cent. iodine, and is used as a substitute for iodoform, being similar in action to iodol and aristol. It is easily decomposed by sunlight.

Diuretin is a sodio-salicylic compound of theobromine, corresponding to the soluble caffeine salts. Theobromine has been proved to act as a powerful diuretic, but as it is almost insoluble the new compound is introduced to get rid of this difficulty. It contains 49 per cent. of theobromine, and is very soluble in water. It must be given in doses of 15 grains at least four times a day in order to obtain its best effects. It has been given successfully in all forms of dropsy. Its value depends upon its stimulating power over the renal epithelium, and it has proved safe in both chronic and acute Bright's disease, the quantity of urine being markedly increased without any untoward symptoms. It has no action upon the nervous system, and has often succeeded where caffeine and digitalis have failed, and its action is more lasting. It acts well in cardiac asthma and cardiac dropsy, but is of less use in the dropsy following hepatic congestion and serous inflammations. It is best given in warm water.

Duboisia Myoporoides is an Australian solanaceous plant, yielding Duboisine, an alkaloid identical with hyoscine or hyoscyamine in its physiological effects. It is used in ophthalmic surgery as a substitute for atropine, than which it is said to act more promptly. 1 or 2 grs. of the sulphate to 1 oz. distilled water, or an aqueous solution of the extract may be used. Strong solutions (4 grs. to 1 oz.) when dropped into the eye have been reported in a few cases to cause faintness, giddiness, hallucinations, and collapse, and in the hands of some it has proved a most valuable hypnotic in insomnia, though toxic symptoms often have been noticed. It may be given in mania, like the other mydriatics, in $\frac{1}{100}$ gr. doses.

Dulcin, Sucrol, or Valzin, is a crystalline powder, being a para-ethoxyphenyl urea, introduced as a sweetening agent by

Kobert. It is 200 times sweeter than sugar, but, though safe in ordinary sweetening doses, it is not likely to come into general use as poisoning has followed its experimental administration to animals.

Eka-iodoform is a mixture of iodoform with ·05 per cent. of paraformic aldehyde. It is introduced by Schering with the view that the aldehyde is changed at once into formalin vapour, which sterilises the iodoform. It is used like iodoform, which it closely resembles in every way.

Emetine—A yellowish-white alkaloid, obtained from ipecacuanha. In small doses, $\frac{1}{6}$ gr., it produces vomiting, whether injected into the subcutaneous tissue or swallowed. It does not act so speedily when injected. In either case it is eliminated by the liver and gastro-intestinal tract. It causes vomiting through reflex action, by irritating the *endings* of the pneumogastric nerve in the stomach when swallowed or injected. It also acts by stimulating the centre which presides over the act of vomiting.

Dose as an expectorant, $\frac{1}{120}$ to $\frac{1}{40}$ gr.; as an emetic, $\frac{1}{6}$ to $\frac{1}{4}$ gr.

Cephaeline is the name of another alkaloid obtained from ipecac. Wilde finds that $\frac{1}{6}$ gr. will produce vomiting, and he advises that the weaker alkaloid emetine be only used as an expectorant, and that it should replace ipecac. in the Galenical preparations.

Emol is an impalpable powder, something like Fuller's earth, introduced by W. A. Jamieson; it is found in Perthshire. Used with water it raises a lather like soap, and the powder made into a paste with water has been applied to the palms and soles in keratosis, and covered over with oiled silk. The epidermic masses peel off, leaving healthy skin behind.

Enterol is the name given to a new antiseptic, being a liquid mixture of the three cresols. It is praised as a urinary antiseptic of great value which acts upon the pelvis of the kidney and bladder after elimination. The dose is 1 dr. of a 1 in 500 solution in gonorrhœa, cystitis, pyelitis, &c. It may be given in pill or capsule, but it is contra-indicated in gastric ulcer and acute Bright's disease.

Eosote, or Valerianate of Creosote existing in the liquid form is introduced as an anti-tubercular remedy. It is claimed for it that it is devoid of corrosive or toxic properties, and it is given in capsules, the daily dose being brought up to 30 mins. The reports of Grawitz show that it is well tolerated by the stomach, and that it acts as an intestinal antiseptic.

Erythrol Tetranitrate has been used by Prof. Bradbury with success in angina pectoris. It is a derivative of erythrite,

and belongs to the group of vaso-dilators to which nitrite of amyl and glonoin belong. 1 gr. of the solid crystals may be given, dissolved in 1 dr. alcohol, every three or six hours in water, but it can be best given in tabloid form. Recent reports show that it may be taken in doses as large as 6 grs. five times a day. The value of the drug lies in its being able to ward off the attacks, and by a judicious use of it these may be prevented entirely. It has no advantage over amyl or glonoin in cutting short the attack if once started. It is unfortunately very expensive, and liable to explode when heated and triturated during its manufacture into tabloids. Mannitol hexanitrate acts also in a similar manner as a vaso-dilator.

Eseridine has been introduced as a substitute for eserine ; it exists in the Calabar bean, and was supposed to be less toxic than eserine, a statement disproved by subsequent research. Schweber's experiments prove that it possesses no advantages over eserine, and it is only $\frac{1}{6}$ part as active.

Ether Oxalic and Ether Methylic. (See under Æther.)

Ethidene Dichloride, or Chlorinated Chloride of Ethyl $C_2H_4Cl_2$, is an anæsthetic which closely resembles chloroform in its physical characters. It was recommended by Snow, and has been made the subject of very careful experiments by a committee appointed by the B.M.A. They reported that it was more dangerous than ether, but less so than chloroform. It is more pleasant than chloroform, and much less exciting in the early and after stages, and recovery from its influence is more rapid than in the case of ether or chloroform. The vapour of about $\frac{1}{2}$ oz. will, generally speaking, be found enough to produce anæsthesia in the adult. Opacity of the cornea has been seen to follow its use owing to its power of dehydrating the corneal tissue. Much difference of opinion exists about the safety of this anæsthetic, and Ringer states that it affects the ventricle like chloroform, whilst others affirm the contrary. Many deaths have been reported from it, and notwithstanding the results of experiments the drug is probably decidedly more dangerous than chloroform and ether.

Ethyl Bromide, Chloride, &c. (See under Æthyl.)

Ethylene Bichloride $C_2H_4Cl_2$ is isomeric with Ethidene Dichloride, with which, however, it should not be confounded. It is also known as Ethene Chloride or Dutch Liquid. It is capable of producing anæsthesia like chloroform and dichloride of ethidene, and probably is safer than either of these drugs, as it always acts in overdoses upon the respiration, and not upon the heart. The objection to its use is the great irritation produced by the local action of its vapour upon the air passages.

It is a good local anæsthetic. The opacity of the cornea resulting from its administration is not caused by actual contact, but occurs after the drug has gained admission to the blood.

Ethylene Bromide $C_2H_4Br_2$ is a heavy, sweet liquid, with a chloroform-like odour, and containing about 91 per cent. of bromine. It is a powerful irritant, and should be used with caution. There is difficulty in its administration owing to its insolubility; it is best given with, at least, 4 times its bulk of almond oil in capsules. 3 minims appear to be a fair dose. It is reported to give results in epilepsy far superior to those obtained by any other bromine preparation. Donath gave it mixed with an equal quantity of spirit flavoured with peppermint in milk.

☞ Bromide of Ethylene should not be confounded with Bromide of Ethyl. (See page 490.)

Eucaine Hydrochloride is a crystalline salt introduced as a substitute for cocaine. It is Benzoylmethyltetramethyl-g-oxypiperidin-carbonicmethylester in the form of colourless soluble crystals. It is a local anæsthetic, and may be applied to the throat and nose in 2 to 5 per cent. solutions. It has not proved quite satisfactory in eye work as it causes smarting, but Berger uses 1 part of cocaine with 1 part of this substance in 90 of water for the conjunctiva. It hardens the tissue and injures the corneal epithelium, but it is less toxic than cocaine, and does not affect the pupils. It is useful in dental work, and may be injected into the tissues round the teeth before extraction. It may be rubbed into the skin before operating in the form of an ointment 10 per cent.

Eucaine B. is a more satisfactory preparation; it can be sterilized by boiling without decomposition, and can be injected hypodermically in doses of 5 to 10 grs., and it is less toxic than eucaine A. The anæsthesia produced by both substances lasts only half as long as that produced by cocaine.

Eucalypteol, or Hydrochloride of Eucalyptene, exists as white scales, obtained from eucalyptus oil, and its action is the same. It is recommended for internal use in preference to the oil, especially for bronchial troubles and phthisis, in 5 gr. doses in capsule or emulsion, or with sugar; it may be given wherever the oil is indicated; or 30 grains may be given as an enema with olive oil.

Eucalyptol is a colourless liquid prepared from the oil of eucalyptus (six different species), being that portion of the oil which passes over between 347° and 351°. It is used in all the conditions in which eucalyptus oil is indicated. Martindale recommends it for oro-nasal inhalers, because it does not dry up

like a varnished coating. It is given internally in capsules containing 5 minims each, in bronchial affections, cystitis, diarrhœa, asthma, &c. It is also called Cineol.

Eucasin is a tasteless powder, easily soluble in water or warm soup. It is a compound of ammonia and casein, and is of great nutritive value, especially recommended in gout, typhoid fever, phthisis, and chlorosis. It is easily digested and leaves little residue. Salkowski finds it a suitable substitute for meat albumen, and it leads to a reduction in the excretion of uric acid; 1—2 ozs. may be given in soup or cocoa. Weiss states that it contains 95½ per cent. proteid, as against 20½ in beef.

Euchinin is a crystalline *tasteless* substance, obtained by acting on quinine with ethyl-chlorocarbonate. The chloride is soluble in water, and is introduced as a substitute for quinine in 10 gr. doses as an analgesic, and antipyretic in cachets or tablets in whooping-cough, tubercle, neuralgia, &c. Gray has obtained good results from it in malaria.

Euchlorin is the name given to a solution of chlorine in water, which is used as a gargle in diphtheria, and as an intestinal antiseptic in typhoid, &c. (See under Chlorine, page 360.)

Eudoxin is a bismuth salt of the iodine and phenyl compound called Nosophen, existing as a brown insoluble odourless powder. It is given in 15 gr. doses in tubercular ulceration of the intestine, and in 2—4 gr. doses in the enteritis of children. Externally it is used as a substitute for iodoform, especially in nose and throat cases.

Eugenol is an oily liquid, smelling like cloves, obtained from oils of cloves, cinnamon, and other oils. It is a powerful antiseptic, and is not toxic; it possesses antipyretic properties, and is a very valuable local anæsthetic in neuralgia and toothache. 15 grs. may be given in wine 3 times a day in phthisis. It has been employed 10 grs. to 1 oz. lanoline in pruritus.

Eunatrol, or chemically pure sodium oleate, is a white soluble powder, introduced as a powerful cholagogue and solvent for gall stones. It is best administered in the form of pills, each containing 5 grs., and 3 or 4 such may be taken twice daily. Blum reports most favourably of this remedy.

Eupatorium Perfoliatum, or Boneset U.S.P., is a valuable bitter tonic, like calumba, but it possesses diaphoretic properties. The warm infusion (1 oz. to 1 pint) in wine-glassful doses every two hours produces copious sweating; in 4 times this quantity it is an emetic, like warm chamomile infusion, and also a purgative. It has been used to act upon the skin in bronchial catarrh,

influenza, and muscular rheumatism, and its cathartic action has been utilised for the expulsion of tape and round worms.

Euphorbia Pilulifera, or Pill-bearing spurge, paralyses the respiration and heart, through its direct action on the respiratory and cardiac centres. Marsset obtained good results with it in the dyspnœa of asthma, emphysema, and bronchitis; and Tison and Beaumetz in dyspnœa of cardiac origin. It appears to act beneficially upon spasmodic dyspnœa, from whatever cause arising, probably by its influence over the vagus, but its best effects are seen in ordinary spasmodic asthma; coryza and hay asthma have been markedly benefited by it. The gastric irritation arising from its administration can be avoided by giving the dose in a state of free dilution. 1 gr. of the extract, or 10—30 minims of the B.P.C. tincture, 1 in 5, freely diluted after meals, may be given 4 times a day.

Euphorine, or Phenyl-urethane, is an insoluble, colourless, crystalline powder, with a clove-like odour. It has antipyretic, analgesic, antiseptic, and antirheumatic properties like salicylic acid and antifebrin, and has been used in about the same doses as antifebrin (8 grs.) in fevers, neuralgia, and migraine, &c. Sansoni gave it in 20 to 30 grain *daily* doses in acute rheumatism, sciatica, orchitis, and other painful febrile affections, and applied the powder to ulcers and chronic ophthalmia. Its antipyretic action is prolonged, and accompanied with profuse perspiration, and free from the danger of cardiac collapse. 8 grs. are about equal in antipyretic effect to 16 grs. of antipyrine. It may be given in tabloids or dissolved in wine. The powder is applied to chancres and ulcers, and is much praised in gynæcological practice.

Euphrasia, or Eyebright, is a scrophulariaceous plant, containing tannin, and an acid which appears to exercise some astringent and alterative action upon the upper part of the respiratory tract. It has been extolled in coryza, bronchial affections of the larger tubes, hay fever, and measles. The tincture (2 ozs. to 1 pint) may be given in doses of 10 or 15 minims every 3 hours.

Euphthalmine Hydrochlorate is a colourless crystalline soluble salt, derived from n-methyl-vinyl-diacetone-alkamine. A 5 per cent. aqueous solution causes rapid and complete dilatation of the pupil without pain or other drawback, and it is recommended in ophthalmic work in preference to atropine.

Euquinine is Quinine ethylcarbonic ether. It is a tasteless substitute for quinine, it exists as sparingly soluble crystalline needles, which possess all the virtues of quinine without any drawbacks, save that in large doses it causes tinnitus. It has

been proved to act like the older salts in malaria, influenza, fevers, &c. The dose is twice that of the sulphate or hydrochloride, and may be given to children in milk or soup.

Europhen, or Iodide of Isobutylorthocresol, is a yellow bulky powder with a saffron-like odour, insoluble in water and soluble in alcohol. It is prepared by the action of iodine upon isobutylorthocresol. It is bland and unirritating. It acts like aristol, and is claimed to be perfectly harmless, as no cases of poisoning have been reported. It slowly gives off free iodine in contact with moist surfaces. From the voluminous literature of this drug, it would seem to be the best of all the recent substitutes for iodoform, and it has been used like it in every conceivable condition of wound, ulcer, chancre, lupus, tubercular growth, &c. In venereal sores it certainly should replace iodoform entirely. It may be diluted if necessary with borax, but not with starch, and 5 per cent. ointments may be used as dressings and applications to moist skin diseases, as intertrigo and impetigo. It contains nearly 30 per cent. of iodine, and does not smell, irritate, or poison. Flick claims to cure early phthisis by rubbing in ½ oz. of a solution (1 in 20) in olive oil into the groins and armpits. It is also administered as a hypodermic injection (15 minims of a 1 per cent. solution in olive oil) in secondary syphilitic affections.

Exalgin, or Methylacetanilide, is a salt occurring in needle-like crystals, which are sparingly soluble in water, and easily soluble in dilute alcohol. It is used only for its pain-relieving qualities. 5 grains will be generally found to relieve most cases of pain from whatever cause. Its best effects have been obtained in neuralgia, and it has been known to relieve patients in whom the other new analgesics had failed. Fraser found it to succeed in 48 cases out of 52, though his dose was small (½ to 2 grs.). The writer has failed very many times with this dose. 3 or 4 grs. 3 or 4 times a day will relieve almost all forms of neuralgia, migraine, sciatica, and every painful affection in which antipyrine has been successful. It diminishes the amount of urine and of sugar in diabetes as the other analgesics do, but its administration does not lead to any lasting results in this affection. The urine has been found to become almost black under its prolonged administration for neuralgia, but no harm resulted. The drug cannot be said to be gaining in favour, and the writer's experience of it is that it sooner requires increase of the dose than the older analgesics.

It may be administered in pill or weak spirituous solution.

Fabiana. (See Pichi.)

Fellow's Syrup of the Hypophosphites presents the virtues of the hypophosphites of iron, quinine, strychnine,

sodium, and manganese in the most elegant and efficient form. Each drachm contains, according to the formula of the makers:— Of hypophosphites of iron, 1 gr.; quinine, $\frac{3}{4}$ gr.; strychnine, $\frac{1}{64}$ gr.; calcium and manganese, of each, 1 gr.; potassium, q.s. The dose is 1 fluid drachm freely diluted. The original syrup is always uniform, and does not decompose or crystallise.

Ferratin is a reddish, brown powder, claimed to be identical in composition with the iron substance found in pig's liver, and from which the colouring matter of the blood is formed. It is a weak albuminate (7 per cent. of iron), and is prepared from albumen and ferri et sodii tartras. It is claimed for it by Schmiedeberg that it is a food, and should be used in all cases of faulty nutrition, and that it is the most easily absorbed iron preparation yet known. It has been used extensively in every condition where iron is indicated, in daily doses of 15—20 grs. in powder. It is probable that further experience will prove it to be a valuable iron preparation, not more efficacious, however, than the tried inorganic salts.

Ferri Albuminate. (See under Hæmoglobin.)

Ferripyrine is a dark, red, soluble powder, containing 12 per cent. of iron and 64 of antipyrine in combination. It has been found a valuable hæmostatic or styptic when applied in 20 per cent. solution. It does not cause any irritation or destruction of tissue, and is a mild anæsthetic. It may be used for the nose, throat, vagina, or uterus on tampons, and taken internally in chlorosis, gonorrhœa, hæmatemesis, and diarrhœa, in doses of 1 to 2 grs. in solution. A liquid sold under the name of Ferro-styptine appears to have somewhat similar properties and composition.

Ferrosol is a dark-brown liquid with an unpleasant taste, being a compound of ferric saccharate with sodium chloride saccharate. It is recommended by Böhm as a remedy in anæmia, chlorosis, and all diseases in which iron is indicated, in 3i. doses.

Formalin, or **Formol,** is the 40 per cent. solution of formic aldehyde. It is prepared by passing the vapour of methyl alcohol over red hot coke. It is found to be one of the most powerful antiseptics known; 1 in 50,000 prevents the growth of bacteria in meat solutions. A 3 per cent. solution will kill all pathogenic organisms in a minute, and is used to sterilise the hands and instruments, though it cannot be satisfactorily used as a disinfectant to wounds as it causes a necrotic action. Sprayed through a sick room it is a powerful antiseptic, even in 1 per cent. solution, and this will immediately deodorise fæces and cause no injury to leather or clothes. A 40 per cent. solution has been applied to chancres and ringworm of the scalp; a $\frac{1}{2}$ per cent. solution cures gonorrhœa. The inhalation of formol has

been used with good results in tuberculosis, pertussis, and diphtheria. Under the names Holzine, Holzinol, and Sterisol, a 20 per cent. solution is introduced for domestic use as an antiseptic for rooms, utensils, &c. It has been used for the hardening and preservation of specimens and in microscopic work, and to the writer it seems to preserve the colour of the specimens in a remarkable way. Merck has patented a process for making Formaldehyde-Casein, a yellowish, white powder, which is antiseptic, and has been used as a powder, and as a gauze for ulcers and wounds.

Glutol is the name given to a formalin gelatin made by exposing gelatin to the fumes of formalin. It becomes hard and can be easily powdered. The new compound has been found by Schleich to possess surprising action when dusted over fresh wounds. They soon scab over, and are protected from all infection. Septic wounds are sprinkled over with it, and if an acid pepsin solution be added the action is very much quickened. His results are denied by Warman.

Amyloform is a compound of starch with formaldehyde used in the same manner as glutol. It is an intestinal disinfectant.

Dextroform is a compound of formaldehyde with dextrin, and has been given internally and used as a 10—20 per cent. injection in gonorrhœa.

Formanilide exists as colourless crystals, obtained by acting on aniline, with oxalic acid. It is a powerful analgesic, antipyretic, hæmostatic, and local anæsthetic. It is given in doses of 5 or 6 grs. in neuralgia, &c., and mixed with starch as an insufflation in throat and laryngeal ulcerations, and as a 2 per cent. solution for the urethra before passing instruments.

Formin (Urotrophine) is a white, soluble, crystalline body, formed by acting on ammonia with formalin. It is powerfully lithontriptic, and acts on uric acid as piperazine does, and it is held that it will dissolve uric acid concretions when the urine is acid. It is hexamethylenetetramine, and may be given in doses of 15 to 25 grs. in water. Loebisch believes that in the blood it decomposes into ammonia and formaldehyde, the latter substance acting as a uric acid solvent on elimination.

Franciscea Uniflora. (See Manaca.)

Fuchsin (Rosein or Magenta), as used in medicine, is the brilliant iridescent crystals of the hydrochlorate of rosaniline, recommended by Bouchut as a remedy for albuminuria with œdema. The drug is rapidly passing into disuse; it colours the saliva and the urine red, and can only be given in pill as its watery solution stains the lips deep red, and it also affects the vision. Reiss, who affirms that the proper dose is $\frac{1}{64}$ to $\frac{1}{10}$ gr.,

reports 20 cases treated with these doses; all were greatly benefited, and he says in two the effects were truly wonderful. The result in these two cases probably might have been equally wonderful had the drug not been employed. It has been applied in erysipelas.

Fucus Vesiculosus, or Bladder Sea-weed, at one time enjoyed a position in the Dublin Pharmacopœia. Its virtues have been chiefly found useful in scrofula, various glandular and joint enlargements, and bronchocele. D.-Duparc used it in psoriasis, and discovered that it caused the absorption of adipose tissue. Its pharmacology has yet to be worked out; some believe it causes emaciation by the amount of iodides which it contains, but iodine or iodides will not produce the results claimed for this wrack; others believe it to be uncertain or powerless, and it is rather a significant fact that the pig, which is regarded as closely allied to man in some physiological and structural points, has been fattened for market on the fucus vesiculosus in the North of Ireland. An extract has been sold as a remedy for obesity under the title of "Anti-fat."

5 to 30 grs. of extract, or 1 to 3 drs. of the fluid extract, may be given 3 times a day.

Fuller's Earth—A clay or native silicate of alumina, containing minute quantities of iron. In the form of impalpable powder, it is a valuable emollient and "drying" remedy in weeping eczema, and especially in the intertrigo of infants. It resembles the oxide of zinc in its properties.

Galium Aparine, or Cleavers or Goose Grass, is a succulent annual plant which has been a domestic remedy for various strumous disorders, and the juice has been applied to disperse glandular growths, and to stop hæmorrhages. Prof. Quinlan finds by making a poultice of the chopped stalks and applying it to chronic ulcers, that "it acts as a slight stimulant and powerful promoter of healthy granulation." Dr. Boyce testifies to its value as a palliative in cancer. He gives 5 ozs. of the juice daily, and applies a strong ointment to the ulcerated surface, which he afterwards covers over with a dressing of the bruised leaves.

Winn has found it to cure psoriasis after all other remedies failed, and Ogle recommends its administration in epilepsy. It also is given in cystitis.

Gallacetophenone is a yellow powder derived from pyrogallol, which is introduced as a substitute for this drug in psoriasis; it does not stain linen, and in 10 per cent. ointment has given good results. Its effects show themselves, it is stated by Rekowski, in 12 hours. It may be applied in solution 4 per cent. in water to which 30 per cent. sodium acetate has been dissolved. It has been tried also in eczema.

Gallal. (See under Aluminium.)

Gallanol or Gallol (Gallic Acid Anilide) exists in colourless, sparingly, soluble crystals. It is introduced as a substitute for chrysophanic acid in psoriasis, applied as a paste with traumaticine; mixed with inert powders dusted on eczemas or applied as a 1 in 5 ointment. It has also been used in ringworm. It is non-irritating and non-poisonous, and is recommended when the face is affected, as it reduces hyperæmia without staining.

Gallicin (Gallic Methylester) is a soluble crystalline salt; it has been found very serviceable by Mellinger in strumous or phlyctenular ophthalmia, and in all inflamed conditions of the conjunctiva. It is dusted twice daily into the eye (in form of *fine* powder) as a substitute for calomel. It is the methylic ether of gallic acid, and resembles this substance in its action. Iodogallicin is an iodine salt of gallicin, which is introduced as a rival of airol (page 492).

Gallobromol or Dibromogallic Acid exists in white crystalline needles, soluble in 9 parts water; it is recommended as a substitute for the ordinary bromides in the usual doses. It is a powerful antiseptic, and has many advocates as an injection (3 per cent.) in gonorrhœa and cystitis. It is claimed for it that it prevents chordee. The injection should be prepared fresh.

Gaultheriæ Oleum—The fragrant oil of winter-green consists of salicylate of methyl to the extent of over 90 per cent. The oil of sweet birch has a similar composition. It has been administered as an antipyretic in acute rheumatism, in which disease its effects are identical with those produced by salicylic acid. It has a pleasant taste, and may be given in doses of 15 minims in emulsion or capsule every 3 or 4 hours. It is a source from which to obtain salicylic acid, and it is still a disputed point whether the acid derived from it is more efficacious than the artificial acid.

Gelatins, Medicated, are used by Unna instead of greasy ointments. His dressing consists of a firm elastic gelatin preparation containing gelatin 4, water 10, glycerin 10, and zinc oxide 4 parts. This is prepared by heating, and becomes a white solid like vulcanised india-rubber. It keeps in the solid form till required for use, when it can be easily melted by heat and applied to the limb with a brush; over it is applied a gauze bandage which receives another coating, and one or more layers of bandage are then put on, each receiving its coat of gelatin till a firm elastic covering is applied to the entire limb. He claims for this that it can be worn for two months, and is far superior to the rubber bandage. If an ulcer be present it is dressed before applying the gelatin, and afterwards, when its discharge soaks through the coating, a little window is cut,

which permits of its inspection and the application of suitable remedies. He makes a soft basis of gelatin 3, oxide of zinc 3, glycerin 5, and water 9 parts, which may be used in all cutaneous inflammations, prurigo, eczema, acne, &c., and to it, substances like resorcin (2 per cent.), ichthyol (2 per cent.), chrysarobin (5 to 10 per cent.), iodoform and sulphur (25 per cent.), may be added.

Pick dissolves clean white commercial gelatin in double its weight of water on a water-bath. The resulting solution brushed over the skin forms a protective coating, and has been used to form a basis for the application of chrysarobin, naphthol, iodoform, pyrogallic acid, and other active ingredients. Thus, for psoriasis, about 35 grs. of chrysarobin are added to 1 oz. of the hot gelatin solution, and stirred till thoroughly mixed. This when cold makes a cake which can be afterwards melted and applied with a brush to the diseased spots. The Sublimate gelatin used in the treatment of scaly eczema and other skin affections is an elegant and efficient agent. It is prepared by dissolving in a water-bath with water 30 parts of pure gelatin, and evaporating the mixture till its weight falls to 75 parts, at which point 25 parts glycerin and ·05 perchloride of mercury are to be added.

Gelanthum is a new gelatin or ointment basis used as a varnish dressing, and made of gelatin and tragacanth, with 5 per cent. glycerin and 2 per cent. thymol. Ichthyol, resorcin, and other bodies can be suspended in it.

Gelosin, or Agar-agar of Japan, is a mucilaginous principle extracted from Gelidium corneum. Wilde recommends it as an excellent excipient for suppositories. It is dissolved in its own weight of hot water, the active ingredients added, and then run into moulds. It is used as a medium for the growth of bacilli, &c.

Geranium Maculatum, or Cranesbill—The rhizome is an astringent containing tannin. It is used in America in the diarrhœa of children, and may be given in every condition in which rhatany is employed, and as a local astringent in hæmorrhoids, rectal fissure, and in gleet. Dose of the liquid extract (1 in 1) 1 dr.; of Geranin, its active principle, 2 to 5 grs.

Gland Substances—There is not a gland in the body which has not now been suggested or actually administered for some diseased condition, and under Spermine, Thyroideum Siccum (page 478), Spleen Pulp, Pancreatis Liquor (page 427), Suprarenal Gland, &c., will be found short descriptions of the therapeutics of each agent.

There are many of these preparations which are doubtless unscientific and useless, but it is difficult to say that they are

wholly inert, or that they may not yet be found of some value, especially when we reflect upon the decided action of the suprarenal extract on the general blood pressure, and the marvellous effects of thyroid substance in disease.

The following gland preparations are being tried mostly in tabloid form :—

Lymphatic Gland Substance in $2\frac{1}{2}$ to 5 gr. doses of the dried tissue in Hodgkin's disease, leucocythæmia, exophthalmic goitre, &c.

Bronchial Gland Substance has been recently recommended in tubercular disease of the lung and abdomen in 5 gr. doses. Recent reports are unfavourable.

Mammary Gland Substance has been tried in various uterine affections in doses of 10 grs. *ter in die*, but like most of the present list of gland substances it is improbable that it is of any value, though some reporters state that it cures uterine fibroids.

Ovarian Substance seems to have some future before it. In 10 gr. doses of the dried gland many observers have reported relief to the distressing symptoms which have appeared after removal of the ovaries, and about the climacteric period, in amenorrhœa, chlorosis, Grave's disease, acne, neurasthenia, and a host of neurotic conditions accompanying disordered menstruation. The excretion of calcium salts and phosphoric acid is always increased after its administration.

Pineal and Pituitary Gland Substances have also been tried in 1 gr. doses in various brain and nerve diseases ; the latter substance has been vaunted in acromegaly, but it is doubtful if it has any action whatever in the disease, though early reports state that the symptoms improved. Recent reports are contradictory and unsatisfactory.

Prostate Gland Substance, in 2 to 5 gr. doses, has been tried in enlargement of the organ, and in atrophy of the testicles and in presenility, but the results are not encouraging.

Salivary and Parotid Substance is fancifully suggested in various forms of ovarian disease ; and one reporter states that in sixty cases of ovarian disease treated by parotid tabloids, most cases recovered.

Thymus Gland Substance is used in exophthalmic goitre ; and in 5 gr. doses thrice daily the writer has seen benefit from it in this disease, which is always made worse by the administration of thyroid gland. It is also recommended in cases of defective nutrition in children.

Dried Liver and Kidney have been prepared and administered in a host of ailments, but with no definite results. The hepatic

substance has been reported as useful in cirrhosis of the liver with ascites; and the renal, as stated on page 587, is useless in albuminuria.

Dried Lung Substance has been recently extolled as a valuable therapeutic agent in phthisis, bronchitis, and pleural affections. It is almost certain that as at present prepared and administered it is worthless.

Merck has made a departure in this section of therapeutics, and has attempted successfully to place the animal extracts or gland substances in a more scientific form for the treatment of disease. He recognises the grave objections to the dried preparations which are merely media for the administration of the active secretion manufactured in the gland cells, and he has succeeded in isolating the leucomaines contained in the fluid of the glands or organs by the plan of forming double salts of them with chloride of sodium. These preparations he defines by the prefix "opo" (juice or sap), and thus we get Opothymiinum from the thymus, Opothyroid, Opoprostate, &c., &c.

Glutinopeptonate of Corrosive Sublimate is introduced by Hufler for the hypodermic treatment of syphilis. It consists of soluble, silky scales, prepared by treating glutin with hydrochloric acid and adding bichloride of mercury, 25 per cent. 4 grammes of the salt are dissolved in 100 cubic centimetres of water, making a 1 per cent. (Hg.) solution, and each Pravaz syringeful contains one daily dose of sublimate. Four weeks' treatment will remove, it is said, all chance of relapse. Abscesses never occur, and only in a few cases have slight indurations at the site of puncture been observed.

Glutol, or Formalin Gelatin. (See under Formalin.)

Glycerophosphates. (See under Acid. Glycerino-Phosphor.)

Gossypium Herbaceum—Cotton-root bark has been extensively used in America as a substitute for ergot. Prochownick, who recommends a fresh infusion in preference to the liquid extract (1 in 1), has employed it in uterine hæmorrhage caused by abortion, or by fibroid tumours. He administers 1 dr. of the bark infused in 5 ozs. boiling water for 8 minutes, during the first and second stages of labour in cases where ergot is indicated. It is a perfectly safe drug, though not so rapid or reliable in its action as ergot; 1 to 2 tea-spoonful doses of the liquid extract may be given in dysmenorrhœa and amenorrhœa.

Grindelia Robusta—The leaves and flowering tops have been used in America with advantage for spasmodic affections of the respiratory passages, chiefly for asthma and whooping-cough. It has a balsamic odour and persistent acrid taste, and the decoction is an expectorant. In large doses it has a sedative action

on the respiratory centre, whilst it stimulates the brain and cord; in still larger doses it produces sleep and incomplete paralysis of the limbs. The oleo-resin which it contains is excreted by the kidney, and in its passage out acts as a diuretic. The volatile oil is excreted by the bronchial membrane, and hence the action of the drug in bronchitis, emphysema, bronchorrhœa, &c. It has been found to control cystitis and iritis in full doses, and its local application as an injection in leucorrhœa and urethritis, and as a dressing for burns and ulcers, has been praised. The leaves may be mixed with nitre and burned for the relief of asthma.

Dose—Of the fluid extract (1 in 1), 10 to 30 minims; of the pilular extract, 1 to 3 grs., in bronchitis and asthma.

Grindelia squarrosa (an allied species) has been found to possess decided antiperiodic properties which have led to its use in neuralgia, and especially in ague, enlarged spleen, and various forms of chronic malaria. It is also given in asthma.

Guæthol is an oily liquid, being Pyrocatechin-mono-ethyl-ether. It is the ethyl compound corresponding to guaiacol. It is introduced as a substitute for guaiacol when given internally in 4 min. doses in capsules 4 times a day in phthisis, or painted over the skin with the intention of reducing fever or of being absorbed, or of relieving pain in neuralgia.

Guaiacol—Sahli has introduced this colourless liquid as a substitute for creosote in the treatment of phthisis. It is the active constituent of creosote, and exists in beech-wood creosote to the extent of 60 to 90 per cent. It is the methyl ether of catechol or pyrocatechin, obtained by fractional distillation of beech-wood tar creosote. It has been demonstrated to possess powerful lethal action over the bacilli of tubercle by Guttmann, even when in exceedingly weak solutions. Under its use all the symptoms of phthisis or tuberculosis disappear, cough, sweating, fever, chills, anorexia, thirst, &c. It is believed to enter into combination with the chemical virus produced by the tubercular bacilli and thus to destroy its action. Its effects are believed to be identical with creosote, and it is given in the same doses, but it is stated to be less irritating to the stomach. It can be given in solution—1 dr. with 2 ozs. tincture of orange, and 2 ozs. glycerin, and water to 10 ozs. Dose—1 dessert-spoonful; but the capsule form is decidedly preferable. It may be used in carrying out the intensive method of treating phthisis with creosote, and 5 minims three times a day have been given without bad results.

The drug has lately been found to possess two other marked actions—painted upon the skin with a brush and covered over with oiled silk or gutta-percha tissue it reduces the temperature in fevers with certainty, though it may cause sweating and chills. 15 to 30 mins. may be used in this way, and more than half of

the dose by the skin can be recovered in the urine. It is thus rapidly and completely absorbed, and the system can be saturated with it in this manner. It also is powerfully anæsthetic and may be painted or injected over neuralgic nerves with great benefit, and chloroform can be injected with it in sciatica with advantage.

Pure guaiacol is a crystalline solid, and can be prepared synthetically. It is held to be as valuable as the creosote preparation for internal or cutaneous use (1 in 5 of alcohol). Dissolved in olive oil it may be injected as a local anæsthetic.

Guaiacol-Benzoyl. (See Benzosol.)

Guaiacol Carbonate, or Duotal, is a colourless crystalline powder, used as a substitute for guaiacol owing to its tastelessness and unirritating qualities. It is insoluble in water, and may be given in 5—15 gr. doses four times daily in sugar or wafers. It contains 91·5 per cent. of pure guaiacol.

Guaiacol Chloroform is a solution of 12 parts guaiacol in 20 of chloroform; 10—15 minims may be injected in sciatica and other painful conditions instead of morphine.

Guaiacol Phosphate, and Biniodide have similar actions.

Guaiacetin (Pyrocatechin-monoacetic acid), or its soda salt, which is a crystalline powder, is recommended in 5 to 8 gr. doses by Strauss as a substitute for guaiacol.

Guaiacol Iodoform is made by dissolving 1 part of iodoform in 5 of guaiacol. It is used as a remedy injected into lupoid patches.

Guaiacol Salol, or G. Salicylate, is used in 15 gr. doses in tubercle, and as an intestinal disinfectant.

Guaiacolate of Piperidine is a crystalline salt used by Chaplin and Tunnicliffe as a new remedy for tuberculosis in doses of 5 to 30 grs. *ter die* (10 grs. dissolve in 1 oz. water). It is split up in the intestine into guaiacol and piperidine, and does not disturb the stomach.

Guaiacol Valerianate is known as Geosote; it is lauded by Rieck as the most valuable of the guaiacol compounds in tubercular disease of the lung, and locally in lupus and diseased joints or bones. 3 to 8 mins. may be given in capsule three times a day.

Guarana is a dried paste, in hard sticks or subglobular cakes, of a chocolate colour, prepared from the crushed or ground seeds of Paullinia sorbilis, a climbing, shrubby vine from Brazil. The alkaloid, of which it contains about 5 per cent., is identical with caffeine and theine, and is useful in sick headache in similar doses—1–5 grs. The dose of guarana is 10 to 40 grs.

Gurjun Balsam, or Balsam Dipterocarpi, or Wood Oil, has been used in India as a substitute for copaiba, to which it bears

a strong resemblance, but is inferior in every respect as a diuretic. In 1 dr. doses it is a reliable expectorant. Good results have followed its use in leprosy, when used as a local application, and given internally in 2 dr. doses at the same time, in emulsion 1 part, with 3 of lime water.

Gynocardia Odorata. (See Chaulmoogra Oil.)

Hæmalbumin, introduced by Dahmen, is a stable brown powder, soluble in warm water; it contains all the salts and albuminoids of the blood except fibrin. It is claimed for it all the virtues generally attributed to every organic iron preparation before falling into disuse. It is given in 30 gr. doses *ter die* in all states where iron is indicated.

Hæmoglobin, extracted from the pure blood of the ox, is administered by Ziemssen in the form of a large pill or bolus coated over with chocolate and weighing over half a drachm. Two such pills are given three times a day, with good results in chlorosis. The actual amount of iron in each pill or "ball" does not exceed $\frac{1}{45}$ grain.

Vachetta has urged the use of Albuminate of Iron, for which he claims somewhat similar advantages. He administers it in grave cases of anæmia in doses of 5 to 15 grs. every 6 or 8 hours, and has obtained striking results by injecting a 10 or 20 per cent. aqueous solution hypodermically, or into the peritoneal cavity, no evil effects ever following its use. Gempt and Biel use a solution of iron albuminate, which contains 5 per cent. oxide of iron. It may be given in gastric ulcer in 1 dr. doses and mixes well with milk. 1 oz. dried egg albumen and 6 ozs. cold water are added to 160 minims of liq. ferri sesquichlor., $1\frac{1}{2}$ ozs. glycerin, and $1\frac{1}{2}$ ozs. cinnamon water, and well shaken and filtered.

Succinate of iron has been prepared by Haussmann as a substitute for all the iron preparations. Buckler gives it with chloroform in biliary calculi, which he states are dissolved by it. It may be used in every disease in which iron is indicated. It is prepared by mixing hydrated peroxide of iron 5; succinic acid 3; citrate of potash 15; glycerin 15; and distilled water 120 parts. For calculi, 10 minims chloroform and a tea-spoonful of the above may be given 4 to 6 times a day, after each meal.

Hæmol and Hæmogallol are two brownish, tasteless powders obtained by reducing agents on ox blood. They are given in doses of 5 grs. in tablets, and marvellous results are attributed to them in anæmia, though Stockman, our best authority on the pharmacology of iron, could see no benefit from them in chlorosis. The introduction of a long list of elements, in combination with hæmol, has materially extended the materia medica. Thus, there are Bromohæmol (see page 510), Cuprohæmol, Iodohæmol, Ferrohæmol, Mercuro-iodised hæmol,

Zinchæmol, Arseniohæmol. The best idea of the present state of the iron treatment of chlorosis may be obtained by glancing at a recipe for a pill for anæmia recommended in the Therap. Wochenschr. recently by Bettelheim. This pill contains hæmol, hæmogallol, ferratin, hæmoglobin, Blaud's pill mass, precipitated sulphur and magnesia (Merck's Annual Report, March, 1896). The mercuro-iodised preparation is stated to contain 28 per cent. of iodine and 13 per cent. Hg., and there are glowing reports of its virtues in advanced syphilis in doses of 1½ to 5 grs. in pills.

Hedeoma, or Pennyroyal—The leaves and tops of Hedeoma pulegioides yield a volatile oil which has long been a domestic antispasmodic and carminative, like the oil of peppermint. It has a decided stimulating action upon the uterine functions, and has been administered to increase the scanty menstrual discharge or to establish the absent flow in amenorrhœa not depending upon organic disease. 5-10 minims will be found to be a full dose, and generally will produce marked emmenagogue action. It is used in America as a remedy against mosquitoes; these troublesome pests dislike its odour.

Helenin is a stearoptene from Inula Helenium (Elecampane), used in phthisis, bronchopneumonia, pertussis, and enteric affections. Valenzuela states that it is a more powerful antiseptic than boracic, salicylic, or carbolic acids, and is unirritating. He used an injection (1 in 1,500) in cases of septicæmia from retained placenta "with horrible fetor," with striking results. In ozœna, anthrax, and carbuncle it was equally satisfactory. Internally, when given in phthisis, it diminishes thoracic pain, cough, and expectoration. Ferran has pronounced its action upon the cholera bacillus to be more destructive than any other agent. It has been given by Baeza in the diarrhœa of infancy, in doses of $\frac{1}{12}$ gr. in water, with syrup and mucilage, and to adults in doses of ½ to 2 grs. Notwithstanding the numerous glowing accounts about the drug it appears to have passed almost into disuse.

Helleborein is a glucoside existing in the Christmas rose—Helleborus niger. Venturini found that $\frac{1}{100}$ gr. in solution dropped on the conjunctiva produced a complete anæsthesia of the cornea lasting for ½ to 1 hour, without in any way interfering with the intraocular pressure.

It has been used as a substitute for digitalin in hypodermic medication, as it is credited with cardiac tonic properties.

It must not be confounded with the narcotico-acrid glucoside, Helleborin, derived from the same plant.

Hippocastanum. (See Æsculus.)

Holocaine is a new local anæsthetic, being Diethoxyethenyl-diphenylamine. A 1 per cent. solution of the hydrochloride causes anæsthesia of the conjunctiva in 15 seconds. Löwenstamm concludes his reports by stating that "it is a prompt, pronounced, long-lasting anæsthetic, without any unpleasant results." It does not affect pupil, accommodation, or circulation, but it is toxic like strychnine, and cannot be injected.

Hydracetin, or Acetylphenylhydrazin, is a white, inodorous, almost tasteless, crystalline powder, found by Guttmann to possess remarkable antipyretic properties, and to possess powerful antirheumatic virtues. Its use is not free from serious danger; collapse, cyanosis, hæmoglobinuria, and jaundice having been observed after even small doses. ¼ gr. is a fair dose, and ¾ gr. twice daily should not be exceeded. It was vaunted as a specific in psoriasis, but has failed in this disease, and indeed it is questionable if it should be retained in the materia medica, owing to its cumulative poisonous properties.

Pyrodin is the name given to an impure hydracetin, which has been administered in 5 grain doses by Dreschfeld in scarlatina, pneumonia, typhus, and migraine.

Hydrargyri Asparaginas or Imido-succinate of Mercury. (See under Hyd. Succinimidum.)

Hydrargyri Benzoas is used as an agent for hypodermic injection by Stoukowenkoff, Balzer, and others. The solution is unstable and must be prepared just before use, which is a serious drawback. It gives rise to no local trouble, though stomatitis has been reported. The following formula is used:—Benzoate of mercury 5 grs., chloride of sodium 1½ grs., water 10 drachms; the daily dose being one Pravaz syringeful. It should not be used in very fat persons. 15 to 50 injections are necessary.

Hydrargyri Carbolas—Schadeck has introduced this salt of mercury, which he prepares by precipitating a solution of perchloride with carbolate of potash. It is a white, tasteless powder, which he gives, in doses of ¼ gr. 4 times daily, in syphilis. It is especially indicated in syphilitic psoriasis and in tubercular and macular eruptions.

Hydrargyri Cyanidum is obtained by boiling red oxide of mercury with Prussian blue.

This drug has been greatly praised in ophthalmic surgery. Sicherer uses a 1 in 500 solution in ophthalmia neonatorum, and 1 in 100 solution in ordinary ophthalmia. It is also known as the oxycyanide. Stellder uses it in diphtheria. His formula is:—Cyanide of mercury 1 gr., tincture of aconite 1½ drs., honey 5 ozs.; a tea-spoonful of which is given every 15, 30, or 60 minutes, according to age, and a gargle of 1 in 10,000 used at the same time. Lister used a dressing of the double cyanide of mercury

and zinc. Gauze impregnated with it has been prized by surgeons as a powerful unirritating application to fresh wounds. It contains 3 per cent. by weight of the salt, and is tinted with rosolane; before application it is moistened with ordinary carbolic lotion.

Hydrargyri Formamidum—The formamide of mercury was introduced by Liebreich as an antisyphilitic remedy. He believes it undergoes disintegration in the blood after hypodermic injection, mercury being set free. It does not precipitate albumen or cause any irritation of the subcutaneous connective tissue. Kopp and Schmitt have tried the formamide with satisfaction. From half to a whole Pravaz syringeful of a 1 per cent. aqueous solution is injected two or three times a day. The treatment of syphilis by this drug has not gained ground, and relapses have been very frequent.

Scarenzio prefers the hypodermic administration of calomel in suspension, and Shoemaker injects $\frac{1}{10}$ gr. of the pure perchloride deeply into the tissues. It is claimed for the calomel that only 4 injections of 40 centigrammes in all is enough for ordinary cases of syphilis. The hyposulphite of mercury and potassium makes a hypodermic solution which does not cause pain, but it decomposes, and must be made fresh daily, and hence should be discarded.

Bloxam uses Sal Alembroth; he injects 10 minims of the solution mentioned upon page 492 once a week till mercurialism occurs, then once a fortnight, and finally once a month for 18 to 23 months, the total quantity of mercury only amounting to 6 or 8 grains during the entire treatment. Galliott in 4,000 injections of 1½ grs. yellow oxide in 15 minims of vaseline oil had no accidents. Lang used "Grey Oil," for which there are numerous formulæ. The best consists of a weak lanoline ointment of mercury, rubbed up with olive oil and made to contain 30 per cent. mercury. The dose is ·2 to ·3 c.cm. Leloir's grey oil contains 80 parts oil of vaseline, 10 of ethereal tincture of benzoin, and 40 pure mercury. (See the subject of the hypodermic treatment of syphilis in the author's "Dictionary of Treatment," page 877.)

Hydrargyri Gallas is a dull dark-green powder, insoluble in water, and preferred to the tannate as being more stable. It is given in doses of ¼ gr. in pill form in syphilis.

Hydrargyri Iodidum Viride. (See page 396.)

Hydrargyri Naphtholacetas is an insoluble white powder, and has been used like the thymolacetate, but it causes more pain and irritation. It may be given internally in pill, in doses of ½—1 gr. It is used for gauzes and mulls.

Hydrargyri Perchloridi Glutinopeptonas. (See Glutinopeptonate of Corrosive Sublimate, page 541.)

Hydrargyri Salicylas is a white, tasteless powder, extensively used for hypodermic injection and as a remedy for gonorrhœa. It is formed by mixing solutions of nitrate of mercury and salicylate of soda. It causes no pain, and is as powerful an antiseptic as corrosive sublimate. Its great drawback was its insolubility, but Vacher has overcome this by using the following formula for external application :—1 part corrosive sublimate, 2 parts salicylate of soda, and 1,000 parts water. For internal use he injects one cubic centimetre (17 minims) of the following solution :—1 part sublimate, 3 salicylate of soda, 100 water. This dose contains ·154 grs. salicylate of mercury.

Hydrargyri Silico-Fluoridum—This colourless, soluble salt is used as a substitute for the sublimate, being less poisonous and irritating, and equally efficacious in destroying bacteria in solution 1 in 1,000.

Hydrargyri Sozoiodol is a pale yellow powder, soluble in solution of chloride of sodium. It has been given in 1 gr. doses injected into the buttock, and as a powder (1 in 15) sprinkled on chancres and syphilitic sores.

Hydrargyri Succinimidum—Vollert highly recommends the succinimide of mercury for hypodermic use, as it does not precipitate albumen. It is a white shining powder, soluble in water, and does not cause any suppuration at the point of injection. Wolff uses a Pravaz syringeful of a 2 per cent. solution (1 per cent. Hg.), thus each injection equals nearly $\frac{1}{7}$ gr. mercury. He states that it is preferable to mercury glycocoll, and should be injected deeply in an oblique direction under the skin of the buttock into the subcutaneous fat, and the swelling stroked gently till dispersed ; about 20 injections are the average number for ordinary cases.

Hydrargyri Tannas—This preparation, introduced by Lustgarden as a remedy in syphilis, is a tannate of the protoxide of mercury, and contains 50 per cent. of the metal. It is a green, tasteless powder, which decomposes upon the addition of weak alkalies, setting free mercurial globules, and it is believed that such a decomposition takes place in the bowel, and the minute particles of mercury rapidly find their way into the blood. $1\frac{1}{2}$ grs. are administered 3 times a day. Kaposi has used it with benefit in many cases of syphilis. It does not produce any unpleasant after-consequences or disarrangement of the digestion.

Hydrargyri Thymolacetas is a white, crystalline, inodorous insoluble powder, prepared by mixing solutions of acetate of mercury and thymol. It is given internally ($\frac{1}{4}$ gr.) and used

as an injection into the muscles in syphilis, the injections being stated to be nearly free from pain and the danger of abscesses. Vaseline oil is the usual menstruum.

Tranjen treated pulmonary tuberculosis by injecting into the muscles of the buttock this salt, or the thymolate in an emulsion every 9 days. He mixed 3 parts with 40 of liquid vaseline and injected 15 minims. The method has met with little support.

Hydrastine. (See under Hydrastis, page 398.)

Hydronaphthol is a powerful disinfectant and antiseptic, which is believed to be free from all toxic properties; it is an impure form of, or a derivative of B.-naphthol, but its exact chemical constitution is not definitely demonstrated. It has been used by Dockrell in tinea (10 per cent. plaster) with good results, and it has been given internally in typhoid fever, diarrhœa, and other similar conditions in 2 gr. doses. A saturated solution in cold water (½ gr. to 1 oz.) is a powerful antiseptic, free from objectionable qualities, and a solution (1½ grs. to 1 oz.) in *warm* water is a potent disinfectant for *foul* wounds. 20 grs. to 1 pint of ordinary spirit lotion is as efficacious in its action over disease germs as corrosive sublimate solutions.

It may be used as a dusting powder or as a gauze.

Hydroquinone (Quinol) is a derivative of coal tar, and is isomeric with resorcin, and has been found to possess properties not inferior to quinine. It occurs in odourless, colourless crystals, and has been given in typhoid and other fevers. It reduces the fever temperature rapidly, a gramme dose causing a fall of 6 or more degrees. Its effects are more evanescent than quinine or antipyrine, a smart rigor generally issuing in a rise in 4 or 5 hours again. The respiration and pulse are lowered, and perspiration occurs. It is safe, and does not produce buzzing in the ears, headache, &c., and it can be given continuously in 5 gr. doses. It has been little used since the triumphs of antipyrine and antifebrin, but it possesses the advantage of giving little pain when injected hypodermically. 1 in 100 is injected in gonorrhœa and ophthalmia. The drug is now chiefly used in photography. The ordinary safe dose of 5 grs. should not be exceeded.

Hydroxylamine is an odourless, colourless body, being ammonia in which one atom of hydrogen is replaced by hydroxyl. The hydrochloride is the form in which it is always used. It is a salt resembling the chloride of ammonium, deliquescent and very soluble. It is a powerful reducing agent, and has been recommended as a substitute for chrysarobin, pyrogallic acid, and anthrarobin in psoriasis, lupus, and parasitic skin diseases when used as a 1 in 1,000 solution. The results are doubtful, and the agent is a powerful irritant, and when taken internally it is a dangerous poison.

Hypnal, or Monochloralantipyrine, is a crystalline body obtained by mixing strong solutions of chloral hydrate and antipyrine. It is almost tasteless, it has all the properties of chloral hydrate, and all its objectionable points, *i.e.*, it depresses the heart seriously, though in ordinary cases of insomnia it is an effective hypnotic in 20 gr. doses. It must not be given where the heart is affected. It is claimed for it that it has the analgesic qualities of antipyrine, and therefore will induce sleep in the presence of pain.

Hypnone, or Acetophenone, is a strong-smelling, colourless, volatile liquid, insoluble in water, prepared by the distillation of acetate and benzoate of lime. Most unfavourable reports of its value can be gleaned from the various medical journals, and there cannot be a doubt that it rapidly will cease to be used as a sleep producer. Many authorities state that the hypnotic effects attributed to it are positively illusory in every case. It is an antiseptic, and has been used in mask inhalers, but it is an uncertain and dangerous drug. In capsules, 2—6 minims for a dose.

Ichthyol, or Ammonium Ichthyol Sulphonate, is a tarry-looking, viscid liquid, prepared from a bituminous mineral in the Tyrol, consisting of fish and animal remains. The soda, lithia, and zinc sulpho-ichthyolates are similar in appearance, action, and doses to this ammonium salt, which is known as Ichthyol, and which contains 15 per cent. of sulphur. It was introduced by Unna as a remedy for chronic skin diseases in 1882, and since then it has been demonstrated to possess many virtues; thus it is an antiseptic and kills most disease germs; it is a local anæsthetic; it acts upon the small vessels, causing them to contract; it promotes the absorption of exudations, and by saturating the system with sulphur it has been found to possess all the good qualities of that drug.

Charles points out that the sulphur is present partly in direct combination with the carbon, as in mercaptan, and partly in close combination with oxygen, rendering the whole soluble and absorbable. Very large amounts of sulphur can thus be easily introduced into the system by giving this drug by the mouth.

Nusbaum finds it valuable in all diseases in which there is capillary engorgement, and many observers strongly testify to its power in a host of widely different ailments, as chronic rheumatism, pleuritis with effusion, syphilis, asthma, chlorosis, scrofula, phthisis, gout, vesical, intestinal and gastric catarrhs, pelvic neuralgia, and neuralgia of bones, joints, and muscles, metritis, and uterine diseases. 2—5 pills, or capsules, morning and evening, each containing $1\frac{1}{2}$ grs., may be given in the above diseases, as well as in eczema, lupus, acne, &c. No harm has

come of taking ten times this quantity; indeed it has been demonstrated that the drug is free from toxic properties. Charles reports most satisfactory results from it in catarrhal affections of the nose, stomach, and bladder, and in albuminuria and nephritis. In gonorrhœa a 3 per cent. injection has proved most valuable, and it has been extolled as an injection in cystitis and diseases of the uterus and Fallopian tubes. Charles found that ichthyol increased the body weight, and at the same time improved the general health. Externally a 1 to 30 vaseline ointment is employed for wounds and burns, and excellent results are obtained by a 20 per cent. collodion, or a 50 per cent. ointment in erysipelas, owing to its lethal action on the bacilli; the best formula is equal parts of lanoline and ichthyol. Since it produces so little irritation it may be used in any strength of ointment from 1 to 30 per cent. in eczema, acne, psoriasis, herpes, erythema, boils, carbuncles, and ringworm. The writer has found it, when made into a suppository with conium ointment, to be a splendid agent for the relief of fissures and hæmorrhoids.

Sulpho-ichthyolates of Lithium, Soda, and Zinc are also employed. They act like ichthyol.

Unna has introduced a 33 per cent. solution of ichthyol-sulphonic acid under the name of Anytin. He claims for this solution that it has the power of dissolving the other constituents of ichthyol, and to their solutions he gives the name of Anytoles.

Ichthalbin is a brown, tasteless powder, introduced by Sack. It is an albuminous compound prepared like tannalbin, and is tasteless, and insoluble in the stomach, splitting up in the duodenum. 4 parts are equivalent to 3 of ordinary ichthyol. It is intended for internal use.

Ingluvin is a powder prepared from the gizzard of the common fowl, and it was introduced as a variety of pepsin to supplement the action of the gastric juice in atonic dyspepsia. It has been proved that ingluvin exerts a very feeble digestive action upon albuminous foods outside the body. It has been found efficacious in the vomiting of primiparæ, especially if associated with anæmia; it should be given very early in the morning, and repeated every 4 hours in 10 to 20 gr. doses. It has been found useful occasionally in the dyspepsia and flatulence of phthisis.

Inula. (See Helenin.)

Iodantipyrine, or Iodopyrine, is a colourless, tasteless inodorous antiseptic, slightly soluble in cold, but freely soluble in warm water, prepared by mixing solutions of iodine and antipyrine. It possesses most of the virtues of antipyrine, and has been used as an antipyretic in 15 to 20 grain doses. It possesses also the action of an alkaline iodide. Jaksh has employed it with success in asthma, and it has given excellent

results in subacute rheumatism. It may be given in tabloids or wafer papers.

Iodine Trichloride is an antiseptic introduced by Langenbuch, and is a yellow powder prepared by acting on iodine with dry chlorine gas. It contains over 50 per cent. iodine. 1 dr. in 1 gallon water makes a solution which, when applied to wounds, gives off its chlorine readily, and acts as a powerful antiseptic and disinfectant without the dangers of carbolic acid, iodoform, or sublimate. He speaks most highly of its use in 100 amputations, and he gave ½ oz. doses of the above solution every two hours with success in dyspeptic troubles arising from gastric fermentation.

Iodipyrin is a yellow, oily liquid, being a compound of 1 part of iodine with 9 of sesame oil. It is introduced by Winternitz as a means of administering iodine in cases where large doses of iodides are necessary, as in syphilis. Iodine has been found in all the tissues of the body after its administration. 1 to 4 drs. may be given, and he calculates that it is twice as efficacious as potassium iodide.

Iodized Phenol is a dark, thick liquid, or semi-solid paste, prepared by rubbing at a gentle heat, iodine 1 oz. and pure carbolic acid 4 ozs., till dissolved. It is a caustic and powerful alterative when applied to uterine ulcerations, and is the best local treatment for abrasions and granular conditions of the cervix. The writer has found that it prevents buboes when lightly painted over the inflamed glands. It is used with success in ringworm of the scalp and body.

Iodocaffeine (Sodium-caffeine Iodide) is a white powder, introduced as a cardiac tonic, possessing the actions of caffeine and an alkaline iodide, and closely resembles in action Iodotheobromine, which is, however, more markedly diuretic. They may be given in doses of 5 to 10 grs. in cachets.

Iodo-Caseine, or Caseo-iodine, is a white powder containing 8 or 9 per cent. of iodine combined in the same manner, it is supposed, as the iodine is in iodothyrin obtained from thyroid gland substance. This substance, as well as a similar one containing about 20 per cent. iodine, and introduced by Lepinois, is recommended in exophthalmic goitre.

Iodoformin is a whitish crystalline powder known as "odourless iodoform." It is a compound of iodoform with hexamethylentetramine. It is used as a substitute for the foul-smelling drug. It acts in the same way, but it is claimed for it that the formol liberated on sprinkling or applying it as a gauze over chancres, tubercular ulcers, &c., acts as a stimulant to the sores, and hastens granulation without forming scabs. It has been injected in gonorrhœa.

Iodoformal is of almost similar composition and action ; it is a combination of ethyl-hexamethyl-entetramin-hyodride, and Reuter states that it is more potent than iodoformin and iodoform.

Iodoformum Bituminatum is a substance prepared by Ehrmann by mixing tar and iodoform together. It has an agreeable odour, and possesses all the virtues of iodoform without the serious drawback of its penetrating and easily-recognised odour. It is employed in the powdered form like iodoform.

Iodol (Tetraiodopyrrol) is a yellow crystalline powder, containing nearly 90 per cent. of iodine, obtained by acting upon iodine with pyrrol. It is odourless, soluble in ether (1 in 1), and in water 1 in 5,000. It resembles iodoform in its action, and affects the system like iodide of potassium when taken internally, only that it is very slowly absorbed. 5 to 10 grs. may be given in pill or capsule where this latter salt is indicated. It has been used as a powder to wounds, ulcers, and sores, or as an ether (1 in 10), ointment (1 in 20), or as a paste made with a little spirit. It has been lauded in tubercular laryngitis and pharyngitis. Upon the whole, iodol cannot be said to be gaining ground. Some authorities doubt its usefulness as a surgical dressing, though it is still used as a substitute for iodoform by many surgeons.

Mazzoni's formula is—Iodol 1 dr., alcohol 2 ozs., glycerin 4 ozs.

Iodophenin is a brown, crystalline powder containing over 50 per cent. of iodine. It is prepared by the action of phenacetin upon iodine in the presence of acids, and has been described under the name of Iodophenacetin. It should not be used internally, but is a powerful antiseptic and germ destroyer, 1 in 5,000 speedily destroying bacteria, but it is unstable and highly irritating.

Iodoterpin is a dark, terebinthinate-smelling liquid, prepared by the interaction of terpine and iodine, which it is proposed should take the place of liniment of iodine, as it is readily absorbed by the skin. It is used as a substitute for iodoform when mixed with 10 parts of kaolin.

Iodothyrin is the name given to an active principle containing iodine extracted from the thyroid gland. Thyrocol is another preparation from the colloid material which has been isolated by Hutchison. It is claimed for these and other active principles of the gland that they should supersede the use of the dry gland. It is, however, by no means demonstrated that they possess all the virtues of the gland substance. (See Thyroid.) Stabel and Brian, while acknowledging the value of iodothyrin as a powerful alterative, deny its value in the cases where ordinary thyroid gland substance proves so efficacious. It acts powerfully on metabolism.

Iris, or Blue Flag—The rhizome and rootlets of *Iris versicolor* yield a fluid extract and eclectic preparation, in the form of a brown powder. This latter preparation known as Iridin, is the one generally used. It acts as a powerful hepatic and intestinal stimulant, and closely resembles podophyllin in its effects. It is believed to possess alterative properties, which have given it a reputation as an antisyphilitic and antiscorbutic. It is a diuretic; and has been found to remove jaundice of malarial origin. 1½ to 3 grs. every night in the form of a pill, followed by a mild saline, have given good results in the vomiting of pregnancy and in torpid liver.

Itrol (Argenti Citras) is a light permanent powder used for insufflation. It is claimed for it that it possesses all the advantages of actol (page 489) without producing irritation. It may be dusted over wounds and ulcers, and injected (1 gr. in 16 ozs.) in gonorrhœa and cystitis. 1 in 500 disinfects instruments and hands, and 1 in 1,000 may be used as a gargle for the throat. Credé maintains that this agent is "*the* wound antiseptic proper," and is a certain means of keeping wounds sterile if dusted very thinly over them.

Jacaranda Lancifoliata has been used as a remedy for venereal diseases amongst the natives of Columbia, and Mennell has tried it with considerable success in gonorrhœa and gleet, which had resisted other treatments. He gave 15 minim doses of the tincture (2 ozs. to 1 pint), and in obstinate gleet injected 10 minims to 1 oz. water, which stopped the discharge rapidly. It has been used also with success in psoriasis and rheumatism, and it can be combined with iodides advantageously. Limousin gives the dose of the fluid extract, known as Salud, as 15 to 60 minims three times a day.

Jambul, or Syzygium Jambolanum—The seeds of this myrtaceous tree have been tried in diabetes, and in some cases with no result, whilst in others the remedy was beneficial to an unexpected extent; in one case the urine fell from 7½ to 4½ quarts, and Fenwick reports a case where, in one week, sloughing ulcers rapidly healed and the urine fell to one-half after 2½ grs. powdered seeds three times a day. Double this amount may be given. It has been proved that the drug has a marked power in diminishing phloridzin diabetes in dogs. The fruit is used in India as an astringent in dysentery and diarrhœa.

Jequirity. (See Abrus.)

Juglans Cinerea, or Butternut—The bark of the branches has been long used as a mild purgative, and in smaller doses as a laxative in chronic constipation. Combined with calomel it has been given in intermittent fever and in dysentery.

The nuts yield a bland, unirritating oil. The dose of the fluid extract is 1 to 2 drachms. The resinous extract (Juglandin) may be given in doses of 2 to 5 grains as a purgative.

Kava Kava, or Ava-Ava, is the root of *Piper Methysticum.* Kava was prepared from it by masticating the root for some time in the mouth, adding water to the fibrous pulp resulting from the chewing, and straining—(Yangona brewing). It is now generally prepared by simply pounding or grating the root. After a moderate dose the effect appears to be something like that produced by a large dose of caffeine—a sharpening of the mental faculties and a feeling of freedom from fatigue.

It acts upon the cord, and causes an ataxic gait, after being very freely swallowed, the intellect remaining bright. Kesteven finds that it acts as an alterative upon the genito-urinary organs, and he uses it with success in chronic gleet and obstinate cystitis. It is a stimulating diuretic, and has been found to reduce the acidity of the urine. The *a*-resin obtained from it acts powerfully as a local anæsthetic like cocaine.

Cerna has investigated the action of this substance; he finds that the fluid extract, or the resin, produces anæsthesia of the mouth which lasts for hours. Internally it produces general anæsthesia by destroying the function of the peripheries of the sensory nerves; it diminishes reflex action and causes spinal paralysis.

Keratine is an albuminous substance obtained from horn; it is only used for coating pills in order that they may pass through the stomach without being acted upon by the gastric juice. (See formula for its preparation, page 52.)

Kola Nut (Sterculia Acuminata)—This nut has been used by the natives of Central Africa as a substitute for tea and coffee, and various marvellous virtues have been attributed to it. It contains large quantities of an alkaloid identical with caffeine. Monnet found it produced insomnia, was an aphrodisiac, stimulant to the cerebrum, restrained tissue waste, was diuretic and had powerful cardiac tonic properties, and controlled diarrhœa and acted as a general tonic in doses of 1 dr. of the tincture (1 of the nut to 5) or 2 grs. of the alcoholic extract. In smaller doses it is a gastric tonic, useful in dyspepsia, and an astringent in diarrhœa on account of the tannin it contains.

Kolanin is an active glucoside obtainable from the nuts; it is administered in 3 gr. tablets.

Koumiss is a palatable, effervescing liquid, prepared by exciting fermentative changes in the milk of the cow or mare. It was originally made in Tartary from the milk of the mare, but cow's milk is the basis of all the varieties at present used in this country.

Sakovich rubs up 1 pint of a mixture of the fresh, unskimmed morning milk from the cow, and cold water (equal parts) with 15 grs. of German yeast in a mortar. To this 1 oz. of finely powdered white sugar is added, and the mixture is poured into a champagne bottle and exposed for 24 hours in a warm place (a little over 60°F.) After this it is carefully corked and tied down, and placed in a cool cellar for five days, after which time it is ready for use. The casein is *partially* digested by the fermentation which causes the sugar to be changed into lactic acid, which acts in its turn upon the casein. This precipitation of the casein by the acid relieves the stomach of some of its work.

Ponomaroff has used the cow koumiss with infants successfully. He mixed 1 glassful of unskimmed milk with 2 of water, added 1 tea-spoonful of sugar of milk, and 2 of sugar, and one and a half of beer yeast, and corked all up in a champagne bottle, and shook it frequently. At the ordinary temperature of the room the koumiss was ready in forty-eight hours, and contained ½ per cent. of alcohol. The writer has found that the following is the simplest and best of all plans for the production of artificial koumiss, as detailed in his "Dictionary of Treatment," page 691 (Third Edition):—

In the absence of yeast, a palatable and highly nutritious beverage may be prepared by mixing one part of fresh rich buttermilk and one part of water with eight parts of cow's milk, adding a very little loaf sugar, putting the mixture into a loosely-corked gallon jar, leaving it in a *warm*, but not hot, place beside the fire, where it may be frequently and briskly shaken, and in 36 to 48 hours it is ready for use as a pleasant, sharp-tasted, thick liquid, which slightly effervesces. Some little skill and experience is required in producing a uniform result, and the patient should not give it up if the first and second results are unsatisfactory. After the first batch of this artificial koumiss has been successfully prepared the use of buttermilk may be entirely dispensed with, as an equal bulk of the koumiss liquid can be used instead, in the preparation of each subsequent quantity. Some patients succeed best by leaving out the sugar entirely, and by shaking the mixture very seldom during the first 24 hours. It may be taken *ad lib.* The buttermilk referred to above is that obtained in the process where the cream and milk have been both churned together in the manufacture of butter.

Koumiss is undoubtedly one of the most easily assimilated and nutritious of foods and remedies. It is invaluable in the treatment of all wasting lung diseases, in which case it may be taken *ad libitum.* The weight of the body soon markedly increases under its use, and it will be appreciated when cod-liver oil cannot be tolerated. In various forms of dyspepsia, and especially in the diarrhœa of children, its use is attended

with great benefit. In the protracted convalescence after fever, kidney disease, &c., and in many forms of chronic vomiting, it may be tried with every prospect of success.

Kefir—Under this name has been introduced a new fermented milk, which has been used by the natives of the plains near the Caucasus as a remedy for anæmia, struma, chest affections, and gastric troubles. It is like koumiss, and is prepared from the milk of the cow or mare by adding a minute mushroom collected near the snow-line on the Northern Caucasus ; this fungus can be used over again repeatedly, and is a remarkable and powerful ferment which produces a rich, sparkling beverage in 24 hours. In the vessel in which this kefir is made small hard granules are found of a brownish-yellow colour. These can now be obtained from chemists, and as they maintain their activity unimpaired for long periods, they are very convenient for the manufacture of this beverage, but, as a rule, the above formula answers all requirements. Dose—Same as koumiss.

Koussin is the active principle of Kousso in the form of a yellowish, amorphous powder, introduced as a substitute for the crude drug to destroy the tape worm. 8 grs. are given every half-hour for four times, and a table-spoonful of castor oil administered about 6 hours afterwards.

Kresin is a clear brown liquid with an odour like creolin which it resembles in general properties. It contains 25 per cent. of cresols which are held in solution by sodium cresoxylacetate. It possesses all the antiseptic properties of the cresols, and is a powerful germicide. Compared with carbolic acid it is many times more powerful and much less poisonous ; it mixes with water, forming a neutral solution.

Kyrofin is a crystalline, colourless, sparingly soluble salt. It is methyl-glycolate of phenetidide, and is recommended by Eichhorst as a certain antipyretic and analgesic in doses of about 5 to 8 grs. in all conditions in which antipyrine is indicated. It is not likely to come into general use owing to the severe sweating which sometimes follows its administration.

Lactophenin is a colourless crystalline powder, being phenacetin in which the acetic is replaced by the lactic acid group. It is introduced as a substitute for phenacetin on account of its greater solubility. Numerous reports show that in typhoid fever excellent results are obtained when given in capsules in 10 gr. doses. The fever subsides without drawbacks, and the patient is soothed and appetite returns.

Lamium Album, Dead Nettle, is a labiate plant long used on the Continent by peasants as a popular expectorant. Florain has discovered that the flowers possess powerful hæmostatic

properties, and can be used with advantage in hæmorrhages of all kinds, from the lungs, stomach, kidneys, and uterus. He gives a tincture of the blossoms 2 parts, syrup 1 part, and water to 6 parts, in ½ dr. doses every 30 minutes till the hæmorrhage stops. The strength of the tincture is 1 in 5. Lamine is the alkaloid, and it is also stated to be powerfully hæmostatic.

Lantanine—Neyrete extracted an alkaloid from Yerba sagrada, which he called Lantanine, possessing properties closely resembling quinine, thus it is intensely bitter, a powerful antipyretic and antiperiodic, but it does not interfere with digestion or cause nausea. It may be given in malaria in doses of 25 to 30 grs. in wafer-paper, which prevents its intense bitterness being detected. In neuralgia it may be given in 5 gr. doses.

Lappa, or Burdock—The root of Lappa officinalis has been used in America as an alterative; it possesses diuretic properties, and appears to have more deserving claims as a remedy in the class of diseases for which sarsaparilla is vaunted. It has some power over chronic scaly skin affections. A tincture of the *fruit* (1 in 5) has been used with success in tea-spoonful doses in psoriasis inveterata, where the palms and nails are badly affected. Recently lappa has been vaunted as a drug of great value in amenorrhœa and chlorosis.

Lecithin is a wax-like solid body, containing phosphorus prepared from germs of oats, yolk of eggs, &c. It is a constituent of brain and nerve tissue, and has been introduced as a substitute for phosphorus for internal administration. Serono's egg preparation, when fresh, is harmless. He injects 1 c.cm. daily, and finds great increase in nitrogenous metabolism, red corpuscles, and body weight. Sometimes the number of red corpuscles has been found to be doubled after a short course of injections, and the appetite becomes almost voracious.

Leptandra, or Culver's Root—The eclectic preparation (Leptandrin) from *Veronica* or *L. virginica*, in the form of a brownish-green powder, resembling podophyllin, is the one generally used in medicine. It has been used in *liver diseases*, as a tonic, cholagogue, and purgative, according to the dose administered. It stimulates mildly the liver, and acts as an intestinal tonic and stimulant or irritant, and has been used in diarrhœa and dysentery, and as an adjuvant to podophyllin.

Dose—in pill, 1 to 3 grs.

Lignosulphite is a liquid containing the various balsamic and terebinthinate products and volatile oils existing in woods. It is a refuse product in the manufacture of wood pulp and cellulose for paper making. It has been introduced by Hartmann as a method of treating antiseptically phthisis and respiratory

affections by inhalation. The liquid may be placed in the sick room upon a plate with pine shavings and the vapour or exhalation breathed several times a day. The patient soon gets accustomed to it, and it is claimed for this treatment of tubercular disease of the lung that cough lessens, fever subsides, and body weight increases. It is being tried in various Continental sanatoria according to Merck with benefit.

Lippia Mexicana is an evergreen, creeping, verbenaceous shrub, containing a camphor called Lippiol, which is its active principle. Lippia is a valuable expectorant, and has been given with good results in every form of bronchitis, in asthma, and phthisis. A tincture (1 in 10) made with rectified spirit from the fresh plant (leaves and flowers) may be given in doses of 10 to 40 minims.

Lithium Salts—Quite a number of new lithium compounds have been introduced chiefly as solvents for uric acid.

The Bitartrate is recommended in 5 grain doses in a large quantity of aerated water in suppurative gingivitis and gout. The Bromide is recommended as a substitute for the potassium bromide, as being richer in bromine and being diuretic in 15 gr. doses. It is claimed for this salt that it diminishes albumen in Bright's disease. The Salicylate is given in solution in 20 gr. doses. The Benzoate (95 per cent. benzoic acid) in 15 to 30 grs. The Guaiaconate in chronic rheumatism in 5 gr. pills. The Hippurate in solution in uric acid gravel in 15 gr. doses. Lithium Diuretin, or Uropherin, is a powerful diuretic in cardiac dropsy and Bright's disease in 15 gr. doses in solution. The Ichthyol Sulphonate has the same action and dose as ichthyol. Lithium Symphoral is powerfully diuretic in 15 gr. doses in gout and dropsy. A combination with Piperazine is reported to be a powerful solvent of uric acid. Lithio-rubidio-platini Cyanide, according to Merck, becomes intensely fluorescent under the Röntgen rays. Uricedin is a brown powder containing citrate of lithium with citrates and sulphates of alkalies, prepared by acting upon strong lemon juice with acids and then neutralising. It is used in gout in doses of 1 to 2 drs.

Loretin is a yellow, odourless, crystalline powder, introduced as a substitute for iodoform. It is Meta-iodo-ortho-oxychinolin-ana-sulphonic acid. It may be used as a dusting powder in every condition in which iodoform has been employed, and it appears to be absolutely unirritating, as it has been used in eczema, and it is claimed for it that it has no toxic properties. It is used as a collodion 8 per cent. for erysipelas, and can be applied alone or with chalk, or in an ointment.

Losophan is Tri-iodo-metacresol in colourless, odourless, insoluble crystals. It contains nearly 80 per cent. iodine. It

has been recommended as an antiparasitic agent in skin diseases in 2 per cent. alcoholic solution or 5 per cent. ointment.

Lycetol is a granular, soluble salt. It is Dimethyl-piperazine tartrate, and has been given in the uric acid diathesis in doses of 5 to 10 grs. in solution 4 times a day. It is a strong diuretic.

Lycoperdon Giganteum, or Puff-ball — This common fungus, belonging to the natural order Trichogastres, is found near the fences on the margins of woods, and has been long known to possess hæmostatic properties. It forms a soft and comfortable *surgical dressing*, in addition to its hæmostatic qualities. The mature plant, which is about the size of a fœtal head, is employed. On breaking the outer skin, the dusty mass, consisting of the capillitium and spores is the portion used. The writer has seen it used in formidable hæmorrhages, dusted over the bleeding surface and plugged into deep and tortuous wounds where the open vessels could not be reached with a ligature, and the rapid and effective manner in which it arrested bleeding was most surprising. He has seen it immediately arrest copious hæmorrhages, which he believes could not have been controlled by any other hæmostatic. How its acts is unknown.

The writer, in bleeding hæmorrhoids or fissures, has had great satisfaction with this remedy, which he uses plugged into large hollow suppositories and inserted into the rectum. He has been able to satisfy himself that he has saved life in this way, in a case in which the shock of an operation would have been fatal. He finds it to be an excellent remedy for epistaxis, and he plugs the nostrils with the fungus, leaving it *in situ* for several days, and always finds it to act most satisfactorily in stopping the bleeding.

Lycopodium Clavatum—Fenwick, in a *Resumé* of the drugs used in genito-urinary affections, speaks of the great value of a tincture made from white club moss in frequent micturition and irritable bladder. He gives 15 to 60 minims of an ethereal tincture (1 in 5). The drug is used also in the spasmodic retention of urine in children ; it is also a carminative and laxative, and has been given in enteritis and rheumatism. Externally, it may be dusted over eczema and intertrigo in children and fat subjects.

Lysidin, or Ethylenethenyldiamine, exists in soluble, reddish crystals, which, even in dilute solutions, has marked solvent action on uric acid, but it appears probable, from the experiments of Mendelssohn, that it has little solvent power over uric acid in organic solutions. It is given in doses of 5—15 grs., but is generally supplied in 50 per cent. solution. The bitartrate promises to give better results.

Lysol is a thick oily liquid with a tarry odour, containing 50

per cent. of cresols, obtained by saponification of oil of tar and fat by alkalies ; it is soluble in water, powerfully antiseptic, and it is claimed for it that it is 5 times stronger than carbolic acid and 8 times less poisonous. It is more uniform in its composition and effects than creolin, and, in addition to its antiseptic and disinfectant properties, it is a soap, and has been much used in Germany as a disinfectant for the hands, skin, and instruments, for wounds, and for uterine and vaginal injections, in solutions varying from ½ to 3, or even 5, per cent. It has been recommended as an application to lupus.

Magnesium Sulphite ($MgSO_3$) is a white crystalline powder, which acts like the sulphite of sodium or sulphurous acid. It is a reliable antiseptic, and the sulphurous acid given off acts as a powerful germicide. Martin insufflates the finely powdered salt in diphtheria 3 or 4 times a day with success. He gives it at the same time internally. The adult dose is 30 grs. ; it may be given to children in lozenges containing 5 grs.

Malakin (Salicylparaphenetidin) is a yellowish, crystalline powder with antipyretic and analgesic actions. It acts like a weak antipyrine, and is decomposed by acids. Owing to its insolubility it is administered in cachets or tabloids. It has been given in doses of 15 to 20 grs. in neuralgias, in fevers, and in phthisis with high temperature, and it has been used as a substitute for salicylates in acute rheumatism, where it is said to produce no untoward effects. It has been found to be a reliable vermifuge.

Malleine is an extract prepared from cultures of the microbe which produces glanders. Its only use at present is in veterinary practice, where it is injected as a test for glanders in horses. If the disease be present a smart reaction occurs like what is observed in tubercular animals after the injection of Koch's lymph. The dried malleine now supersedes all liquid preparations ; the dose is ¾ gr. dissolved in 80 mins. water, and it is probably curative in mild glanders.

Malti Extractum, or Extract of Malt or Byne, contains the active principle—diastase—a digestive ferment possessing the property, even when exceedingly diluted, of changing starch into sugar, like the ptyalin of the saliva. Its efficacy depends entirely upon the amount of diastase present, which, in many of the extracts to be met with, is very trifling. It is useful in cases where the digestive power is weak and the assimilation of starchy foods is imperfect. It is a restorative, and is regarded as of more value than cod-liver oil by some. It may be given in doses ranging from a tea-spoonful to a table-spoonful in milk, wine, beer, porridge, tea, or cod-liver oil after meals. Its high nutritive value renders it an agent of great utility in phthisis, scrofula, rickets, and many wasting diseases. It is a good plan

to mix it with the food before being swallowed in dyspepsia, and wherever the digestive functions seem to be seriously impaired. The experiments of Chittenden show that it should be given at the *beginning* of a meal when we wish to produce a decided effect upon digestion. It will not act in acid fluids, and consequently is of most value when given at a time when the acidity of the stomach is least. Combined with cod-liver oil, malt extract is of great value, and the writer has obtained most gratifying results from the combination in wasting pulmonary disease.

Manaca, or Vegetable Mercury—The root, with portions of the attached stem covered with bark, of the scrophulariaceous plant *(Franciscea uniflora)*, has been long used by the Indians as a remedy for rheumatism and syphilis. In America it has been used in *subacute* and chronic rheumatism. Its virtues have been vaunted in scrofula and a host of ailments, in which it will probably be found to possess little or no power. It appears to be a diuretic and emmenagogue, and in large doses a purgative.

Dose—20 to 60 minims, or even 2 drs., of the fluid extract (1 to 1) or 30 grs. of the powdered root.

Mate, or Ilex paraguayensis, is the Brazilian holly which contains a considerable amount of caffeine, and is used in Brazil made into an infusion like tea. Its therapeutic properties depend upon the caffeine and tannin contained in its leaves. It has been given with benefit in failing compensation and in migrainous headaches. According to the researches of Charles it contains only about $\frac{1}{4}$ the quantity of caffeine contained in tea. It has been given in daily doses of 1 oz.

Medulla Ossium Rubra—The red marrow of bone has been highly praised by Fraser as a remedy in anæmia. Various preparations are in the market, for it is most difficult for the patient or his friends to extract the red marrow from the large bones of sheep and oxen. It is possibly owing to the varying strengths of these compounds that the reports of the drug have been so contradictory and unsatisfactory. The glycerin extracts do not appear to be uniform or reliable, the ordinary palatinoid or tabloid forms or the valules are to be preferred. They are generally made to contain 5 grs., and from 2 to 6 of them may be given 4 times a day. Red marrow has been administered with success in several cases of pernicious anæmia, leukæmia, chlorosis, rickets, lymphadenoma, osteo-arthritis, purpura, hæmophilia, malarial anæmia, and tuberculosis.

The writer has employed it in pernicious anæmia, alone and with arsenic, but with unsatisfactory results in a few cases, and recent reports are not so favourable as the earlier ones.

Menispermin (Yellow Parilla)—The eclectic extract, in the form of a brownish powder, contains the active principle of

Menispermum canadense (Canadian Moonseed), and *M. fenestratum*. It is a weak intestinal stimulant, and possesses no power over the liver. It has tonic properties, and has been given in dyspepsia and as an alterative in constipation, 2—5 grs.

Methacetin, or Para-acetanisidin, is an odourless, crystalline powder, white or pinkish white, bitter, and sparingly soluble in water. It is prepared by a tedious process, starting with nitrophenol, which is changed into nitranisol, and afterwards into anisidin. It is a powerful antipyretic in doses about one half that of antifebrin and one quarter that of antipyrine. It is a potent antiseptic in 1 per cent. solution. In fevers of all kinds, acute rheumatism, pneumonia, and every condition in which antipyrine has been given it has been administered, acting with promptness and certainty, though it sometimes causes most profuse sweating. It is considered especially suitable for children. 5 or 6 grs. may be given as a full dose for an adult.

Methylacetanilide. (See Exalgin.)

Methyl Chloride, or Chlormethyl—This gas is condensed in metal cylinders, and used as a local anæsthetic. Upon permitting it to escape it is mixed with air and obliquely thrown as a jet upon the pained part, which it freezes rapidly, depriving it of sensibility. It has been extensively used in sciatica in the Paris hospitals, and with much success. Lumbago readily yields to it. The spray should only be used for a few seconds at a time or eschars may result. Pains and neuralgia of all kinds have been treated in this way recently by a plan called "Stypage." Pledgets of lint are steeped in methyl chloride, and when laid upon the pained part cause it to freeze. Tetanus has been treated in this way by stypage over the maxillæ and spine. Smet maintains that stypage is much better than Debove's plan of spraying.

Others use it by permitting a stream of the liquid to play upon a tampon of wool and silk laid upon the part, as the gas rapidly evaporates from the wool it freezes the part beneath (Helbing).

By saturating chloroform and ether with this gas Richardson's Compound Liquid for general anæsthesia is produced.

Methyl Salicylate is the active principle of Gaultheria ol. (see page 538). An artificial or synthetic liquid is obtained by heating salicylic acid and methylic alcohol, and it is introduced as a substitute. It is less irritating than the natural oil, and very satisfactory results have been obtained by Lannois and Linossier, who found that rheumatism could be treated by smearing over the joints with the liquid and enveloping them in oiled silk and wool, the methyl salicylate is rapidly absorbed, and the joint pain speedily relieved.

Methyl-Violet, or Pyoktanin, is one of the aniline dyes of very complex and possibly varying chemical composition. It is a weak antiseptic, and has been found to be free from toxic properties, as ordinarily employed, and has been extensively tried as a surgical dressing, and as an injection (1 per cent.) in gonorrhœa, ozœna, and ophthalmia. It is doubtful if the drug will ever come into general use owing to its power of staining the tissues, and recent reports are most unfavourable and disappointing. It was supposed by Mosetig to be capable of curing malignant tumours if injected into their substance, but Quenn proved that it was not diffusible. Ehrlich injected it in sciatica and neuralgia, and a powder of 2 per cent. with sugar has been used to kill the diphtheritic bacillus.

Methylal is a limpid liquid, prepared by distilling methylic alcohol with H_2SO_4 in the presence of manganese peroxide. It is an hypnotic and antispasmodic, lying between ethylic alcohol and ethylic ether; it reduces arterial tension, produces sleep, and, though it kills by paralysing the heart, it promises to become a safe and effective anæsthetic when mixed with ether. It may be given by mouth in aqueous solution (1 dr.), or by hypodermic injection, or by inhalation. Personali states that it is antagonistic to strychnine. It has been used as an hypnotic in insomnia, and it is claimed to be the best hypnotic in delirium tremens; and mixed with glycerin and oil or as an ointment (15 per cent.) it has been employed to relieve pain.

Methylene (or M. Bichloride, or M. Dichloride, or M. Chloride, or Dichlormethane) CH_2Cl_2, is a substance about which much confusion exists. It is when of the above composition a heavy mobile, colourless chloroform-like liquid, prepared by a variety of processes.

It has been introduced as a substitute for chloroform, and it was claimed for it by Geuther and Eichholz to be safer, especially in abdominal or ovarian surgery. These claims have not been borne out in practice.

The drug has been used locally as a spray like methyl chloride. According to the above-named authorities the methylene, as ordinarily supplied, consisted of 1 part of this drug and 4 of chloroform.

Helbing states that English methylene is a mixture of ethyl ether and methylene chloride. Other writers hopelessly confuse both substances, and some specimens met with consist of chloroform and pure methylene in varying proportions, and without any smell of ether.

Methylene Blue is one of the aniline dyes. It exists in small greenish crystalline scales which impart a blue colour to the urine after being swallowed. This drug has been tried success-

fully, it is reported, in articular and muscular rheumatism, sciatica and lumbago, in doses of 2 to 3 grains in pill. Ehrlich found that the pure salt is a valuable means of relieving all forms of pain, especially migraine, and its hypodermic use does not cause smarting. It is stated to be *curative* in migrainous headache and to relieve the pains of ataxia with certainty. Since it was found to stain the parasite in malaria, it has been tried with success in this disease in doses of 1½ grs. 4 to 6 times daily. In similar doses it has been given with alleged success in cancer and phthisis. It has been injected into malignant tumours and enlarged glands, and used in gynæcological practice. It forms a compound with salicylate of soda, called Anti-rheumatin, which is given in rheumatic fever in 2 gr. doses. Dr. James Moore, Belfast, has obtained excellent results in gonorrhœa by administering 3 grs. methylene blue with 15 grs. citrate of potash in cachets *ter die*. He demonstrated the action of the drug by examining the discharge microscopically after a few doses. The acute stage was always cut short, and the patient's sufferings minimised.

Methylic Alcohol, or Pyroxylic Spirit or Wood Naphtha, is a limpid, colourless liquid, a product of the destructive distillation of wood. It has been used as a remedy for phthisis, and Neligan and others found great benefit from it in this disease. It has a powerful influence over the hacking cough, and relieves the distressing vomiting of the latter stages of tuberculosis. It appears to act as a sedative to the respiratory centre. Its unpleasant odour is a great barrier to its use. It may be given in doses of 10 minims in peppermint water and syrup. Spirit of wine mixed with 10 per cent. of this substance formerly constituted methylated spirit.

Microcidine is a white powder, being impure naphtholate of soda, prepared by heating B-naphthol with caustic soda. A ½ per cent. solution acts as a powerful unirritating antiseptic for wounds and ulcers, ozœna, &c. Cozzolino uses an ointment in ozœna of 2 grs., with 3 grs. cocaine and 1 oz. vaseline.

Migranin is a colourless powder, being a mixture or a chemical combination of citrate of caffeine and antipyrine (a double citrate). It contains nearly 90 per cent. antipyrine, and is extolled by Overlach as a specific for migraine in 15 gr. doses dissolved in water. The writer has been in the habit of treating all forms of migraine with 10 grs. antipyrine and 5 grs. citrate of caffeine with the best possible results.

Mistletoe, or Viscum Album, has been used in America and in this country as a remedy possessing qualities similar to digitalis, and beneficial results have followed its use in heart affections and dropsies. It has been found that this drug possesses also strong

ecbolic action, which promises to give it a place amongst our emmenagogue remedies.

Dose—5 to 30 minims of a tincture (1 to 8 of spirit).

Mollin is a basis for ointments introduced by Kirsten. It is a potassium soap containing 17 per cent. of excess of fats, prepared by treating a mixture of equal weights of cocoa-nut oil and lard with 20 per cent. caustic potash, and 4 parts water. After saponification takes place, 17 per cent. fat is added, and 30 per cent. glycerin may be also added. Liebreich advises 100 of sapo kalinus (P.Pr.), 50 to 80 lard, and 10 glycerin; or equal parts of lanoline and sapo kalinus. The resulting ointment easily washes off the skin and clothes. It forms an elegant base for mercury, salicylic acid, and the tincture of iodine. This latter, iodine mollin, is a valuable application to scrofulous glands and diseased joints.

Monsonia Ovata and M. Burkei are South African annual plants introduced by Maberly, who found them of great value in dysentery. The dose is 1 dr. of a 1 in 8 tincture. He claims that the average amount of time of 100 cases of dysentery under this treatment was only 2·3 days (90 of these cases were acute.)

Morrhuol is an acid, bitter, aromatic, yellow liquid, containing the active principles of cod-liver oil—*i.e.*, the phosphorus, iodine, and bromine combined, with organic fatty matters. It is prepared by treating the oil with hot alcohol and distilling off the spirit. The morrhuol is very much smaller in bulk, and can be easily administered in capsules containing 3 to 5 minims each. It is not at all probable that the virtues of cod-liver oil are concentrated in this substance, but it can be used to great advantage in cases where the oil cannot be swallowed. Each capsule of 3 minims represents 80 minims of cod-liver oil. (See also under Pangaduine.)

Mullein. (See Verbascum Thapsus.)

Muscarine is the active principle of poisonous fungi obtained from Amanita (or Agaricus) muscaria—Fly agaric; it can be prepared synthetically. It resembles pilocarpine closely in its action, thus it causes profuse salivation, perspiration, lachrymation, and gives rise to rather forcible and painful micturition, and sometimes to nausea and diarrhœa. When applied in solution (10 per cent.) to the eye it dilates, and when swallowed it contracts the pupil.

It is administered in the form of a hypodermic injection of $\frac{1}{4}$ to $\frac{3}{4}$ gr. of the nitrate in 5 minims of water; it has been given in smaller doses by the mouth with success for the night sweats of phthisis. Murrell gives 5 minims hypodermically of a 1 per cent. solution for this purpose.

Muscarine is, with the exception of the local mydriatic and

anhidrotic effects, a decided antagonist to every action of atropine. Atropine, thus, is the antidote in cases of poisoning with fungi, and the writer has been able to satisfy himself that he has saved several lives by the hypodermic injection of atropine upon an occasion when a large number of school children were poisoned by eating fungi.

Mydrine is a white powder, being a compound of hom-atropine and ephedrine. It is used (10 per cent. solution) to cause dilatation of the pupil; the main advantage of its introduction lies in the fact that it is of greatest use for diagnostic examinations, as the mydriasis passes off in a few hours. The solution acts in 30 seconds, and causes no irritation.

Mydrol (Phenyl-pyrazol-iodo-methylate) is a white, soluble powder used in 5 to 10 per cent. solution to cause dilatation of the pupil, which it does without causing irritation or increase of intra-ocular pressure. It is slower in its action than atropine, but its effects pass off much quicker. It has decided anodyne action, and can be used in various painful conditions of the eye. Albertoni states that it is absolutely non-toxic, and that it diminishes the amount of blood in the iris and conjunctiva.

Myrtol exists in the oil distilled from the leaves of Myrtus communis—the myrtle. It has been employed, as an expectorant, in capsules containing 5 minims. This remedy is indicated in chronic or sub-acute bronchitis, or at the end of acute attacks just as the fever disappears. It causes a diminution in the secretion. Two capsules may be given every 6 or 8 hours. 15 minims have been given with marked benefit in gonorrhœa, leucorrhœa, and various forms of bronchial catarrh, cystitis, &c. Recently its power as a disinfectant of the air passages has been demonstrated by Eichhorst, who found the sputum to be disinfected in a few hours in gangrene of the lung after the internal use of myrtol.

Naphthalan is the name given to a semi-solid compound, obtained by fractional distillation from Armenian naphtha. It has been suggested as a substitute for tar in skin diseases. It is dirty and liable to irritate, but it has proved useful in scabies.

Naphthaline ($C_{10}H_8$) is obtained in the distillation of coal tar, and exists in the form of a white insoluble crystalline powder, which is a powerful germicide. It is dusted as a powder over ulcers, sloughing wounds, open cancers, and chancres, as well as fresh wounds and stumps, and may be used for disinfecting cavities. After application the part should be covered with oiled silk and bandaged; a ten per cent. ointment may be used. It is cheap, clean, disinfecting, produces rapid growth of granulations and cicatrices, diminishes irritability and pain, and its application is very simple and easy.

Rossbach thought that owing to its insolubility it could be administered in doses fatal to all minute organisms in the intestinal tube from mouth to anus without doing the patient any harm, as it is not absorbed. He recommends it in typhoid fever, diarrhœa, and dysentery, and it has been loudly praised as a remedy of great promise in cholera, though it must be said that most recent observers deny its value as an intestinal disinfectant. It has expectorant properties, and has been urged as a specific for phthisis. Fenwick speaks highly of it when given in cystitis with fetid urine; it is eliminated by the urine, which it colours brown, but boracic acid fills every requirement that can be wished for in this condition. Recently it has been praised as a remedy for round-worm and tape-worm. Charren states that the administration of naphthaline may be followed by cataract and amaurosis, whilst many others have proved that it may cause renal disease and destruction of red blood cells, and the internal use of the drug requires caution, and only purest specimens should be given internally. The objectionable odour of the drug has prevented its general use. It is the substance known as Albo-carbon, Camphylene, and Alabastrine.

Dose for adults—2 to 8 grs. every 3 or 4 hours; for children—½ to 2 grs. in wafer-paper. It may be given in pills coated with keratine or collodion.

Naphthaline Dioxide ($C_{10}H_8O_2$) is a white, glistening powder introduced by Lepine under the name of Dioxynaphthaline. Its formula will be seen to differ from that of naphthaline by containing O_2. It is poisonous in large doses, and cannot safely be used as a substitute for naphthaline since 15 grs. have produced cyanosis in a patient.

Naphthalol. (See Betol, page 506.)

Naphthol—Beta is now official (see page 419).

Camphorated B.-Naphthol is a syrupy liquid, consisting of B.-naphthol 1 part and camphor 2 parts. 2 minims have been injected in solution with oil into enlarged glands and into the lung in tubercular disease. B.-naphthol carbonate exists as insoluble crystalline scales. It is the di-naphthylester of CO_2. It is decomposed by the alkaline secretions in the duodenum, and it is non-irritating, and it has been introduced as a substitute for B.-naphthol.

Naphthol ($C_{10}H_8O$), or Alpha- or Ortho-Naphthol, closely resembles and is isomeric with B.-Naphthol. Maximowitsch found that 1 in 10,000 made a solution which completely arrested the growth of various microbes, and he calculated that the lethal dose for a man would be about 20 ozs. Shoemaker speaks highly of it as a disinfectant and antiseptic, and he

obtained good results in gonorrhœa and gleet, but he states that it lacks to a great extent the anæsthetic or sedative effects of beta-naphthol in skin affections, and that its internal action is less decided. It is certainly more irritating, and though praised in typhoid and other intestinal troubles its disagreeable taste and odour will prevent its general use. It may be given in 10 to 15 gr. doses in cachets, pills, or dissolved in oil. It has been used as a test for sugar in urine.

Ellenberger and Hofmeister have introduced acids derived from both alpha- and beta-naphthols as powerful antiseptics. One of these is Alpha-oxynaphthoic Acid, which forms soda and potash salts. Schückling strongly recommends the acid as an odourless and cheap substitute for iodoform. He also used a solution ($\frac{1}{2}$ to 1 per cent.) in combination with phosphate of soda in leucorrhœa. (See page 486.)

HYDRONAPHTHOL is described upon page 549.

BENZOYL-NAPHTHOL is mentioned upon page 505.

Naphthol-Aristol is the Diiodide of B.-naphthol, in the form of a greenish, yellow powder, without odour or taste, and insoluble in water. Introduced as a substitute for iodoform, and as a remedy for various skin diseases, as psoriasis and tinea, in the form of 20 per cent. ointment.

Narceine is an alkaloid obtained from opium, in white, silky crystals about whose value as an hypnotic there has been much difference of opinion. It produces sleep, but some affirm it has very feeble powers, whilst others assert that it is a powerful soporific. It has been used to soothe the cough of phthisis. Laborde has had considerable success with it in whooping-cough; he finds that it produces sleep, and checks considerably the night attacks of coughing. He gives $\frac{1}{3}$ gr. to children 3 to 4 years old. It produces no headache or constipation, and is soluble 1 gr. in 1 oz. water. The Meconates of Narceine *(mono-*, and *bi-)* are chiefly employed and have been given hypodermically. Antispasmin is the name given to a compound of narceine and salicylate of sodium. It is used in pertussis in 1 gr. doses.

Narcotine, when in the pure state, is a crystalline alkaloid obtained from opium, which it is now proposed should be called Anarcotine. The sulphate and hydrochlorate are white powders soluble in water. Roberts has demonstrated that this alkaloid has no narcotic action whatever, but it is a powerful antimalarial agent, and already it has been found by Boyle and Maynard to cure malaria, which resisted both quinine and arsenic, and to relieve malarial headache, which resisted antipyrine. The dose is 2 to 4 grs. of the soluble salts, 4 to 6 times a day.

Recently much interest is attached to this alkaloid since it has

been found that Stypticin, a powerful hæmostatic, is obtained by its oxidation. (See under Stypticin, which is Cotarnine hydrochloride.)

Naregamia Alata, or Goa Ipecacuanha, is a small Indian shrub, the juice of which has recently been extolled as a remedy for psoriasis. The root is emetic and cholagogue, and in small doses possesses marked expectorant properties. It has been used in bronchial affections, indigestion, and rheumatism. The best results appear to be obtainable in emphysema and dry catarrhs. The dose of the powdered root is 20 grs.

Neurodin, or Neurodine, is Acetyl-para-oxyphenylurethane in colourless, odourless crystals, slightly soluble in water. It was discovered by Merck and investigated by Mering. It is introduced as a powerful analgesic, superior to antipyrine in neuralgia, migraine, &c., in doses of 15 grs. in wafer or as a powder. Sometimes profuse perspiration follows its use; it is claimed to be otherwise harmless.

Nickel Salts, especially the bromide, have been investigated by Da Costa, who has given it in epilepsy with advantage and in congestive headaches with decided benefit. He finds that much smaller doses are necessary than of other bromides; thus 5 grs. is a fair dose, and 10 grs. a very full dose. It is a green soluble substance. Shoemaker states that if given for a long period this salt causes metallic poisoning; it is best given in effervescence. The sulphate (3 to 5 grs. in solution) has been administered as a nervine tonic in locomotor ataxy.

Nicotine is a colourless liquid alkaloid obtained from tobacco. The bitartrate is a soluble crystalline salt, and has been successfully used in tetanus ($\frac{1}{4}$ to 1 gr.), and as an antidote to strychnine. It has the power when given even in very small doses of enormously increasing the general blood pressure, acting like the suprarenal gland substance, and Schafer suggests that a small dose should be given before chloroform inhalation.

Nitrous Oxide—This colourless, inodorous gas is used as an inhalation to produce general anæsthesia like ether and chloroform. The method by which it produces its effects is still doubtful. It is, however, certain that it affects the cerebral centres, not the peripheries, and it is not decomposed in the system, as some supposed. Joylet and Blanche affirm that the oxide has no effect whatever upon the system, save that of deprivation of oxygen, and it is stated that, save exhilaration, the same result is obtainable with pure nitrogen or by asphyxia. A few deaths have been reported from its use. It differs from chloroform and ether in the rapidity of its action and the quickness with which its effects pass off, so that it is only avail-

able for very short operations like teeth extraction. Glycosuria has been several times known to follow its administration.

In the *Lancet* (May, 1898) Mr. Hilliard has described and figured an apparatus by means of which, through a nose tube, anæsthesia may be prolonged for several minutes by this gas.

Nosophen, or Nosophene, is a pale yellow, odourless, insoluble powder, containing 60 per cent. iodine. It is Tetraiodophenolphtalein. The bismuth salt is called Eudoxin (see page 532), and the sodium salt Antinosin. The nosophen compounds are introduced as substitutes for iodoform, and may be used in every case where that drug is indicated. They are given internally as intestinal antiseptics.

Nucleine, or Nuclein, is a principle of varying and complex composition always containing phosphorus, and generally sulphur, obtainable from yeast, spleen, liver, milk, yolk of egg, &c. The nucleine from yeast, which is chiefly nucleinic acid, or its soda salt, is the one most frequently employed. Nuclein has been stated to be the bactericidal element in human blood, and it has consequently been employed in various parasitic affections as typhoid and scarlet fevers, diphtheria, phthisis, &c. This bactericidal element is believed to be produced by the white blood corpuscles. When nuclein is administered by the mouth, hypodermically, or per rectum, a great increase in the white corpuscles rapidly follows, and their number may be doubled, and the blood serum is found to be strongly toxic to most microbes. Yeast nuclein is a greyish-white powder, soluble in alkaline solutions; it may be given in doses of 10 grs. in wafer six times a day, or in doses of $\frac{1}{2}$ gr. hypodermically; much larger doses have been given. Horbascewski's nuclein from spleen pulp is given in similar doses. Glowing reports are being published of the improvements and even cures of tubercular disease of the lung. Weight increases markedly, and all the symptoms rapidly improve or disappear. Mourek's hypodermic solution is made by dissolving $7\frac{1}{2}$ grs. of the splenic nuclein in as much 5 per cent. soda solution as will cause it to dissolve; $7\frac{1}{2}$ grs. carbolic acid are added, and water to 26 drs. Of this from $\frac{1}{4}$ to 2 drs. may be injected.

Nutrose is a colourless, odourless, and almost tasteless powder, easily soluble in water, milk, soup, &c. It was introduced by Salkowski under its proper name of Sodium Caseinate, being formed by mixing dry casein with caustic soda and boiling with 94 per cent. alcohol. One pint of warm milk will dissolve nearly 1 oz. of the powder. It is rapidly absorbed and does not irritate the bowel, as meat peptones do, and putrefaction does not occur in the intestines when children are fed with it. The results of experiments on animals and man

prove that it contains as much nitrogen as is necessary for the body when administered in moderate amounts. It is indicated in various intestinal affections where meat cannot be borne, and it can be mixed with all other foods. It may be given in teaspoonful to table-spoonful doses.

Orexine is the Hydrochloride of Phenyldihydrochinazolin—a bitter, disagreeable crystalline powder. Penzoldt first pointed out its great value as a gastric tonic and stimulant to the mucous membrane of the stomach. Little is known of its action, but it has been given with satisfactory results in cases of phthisis where the appetite had entirely failed. It may be given in doses of 4–8 grs. in wafers or capsules, the pilular form, according to Helbing, being objectionable, as the pills have been found to remain in the stomach for hours without being digested. Excellent Continental reports are forthcoming showing its great power in increasing the appetite (5 grain doses) in phthisis and after operations, in the vomiting of pregnancy, and in anæmia, but the burning taste of the drug prevents its use in ulcer and acute affections. It is now suggested to use the finely powdered free base (Basic Orexine) in similar doses, followed by a large draught of milk, beef tea, &c., to prevent irritation. Recently the Tannate of Orexine has been employed as a gastric tonic with success in 5—10 gr. doses. It is tasteless.

Orphol. (See under Bismuth Salts.)

Orthine, or Orthohydrazin-paraoxybenzoic Acid, is an antipyretic, the hydrochlorate of which is a stable soluble salt. It was introduced by Kobert, who obtained it by acting upon hydrazine with an acid isomeric with salicylic. Experiments with dogs seemed to show that it was free from danger, but when given to man it caused severe perspiration, followed by collapse and delirium, and its administration is questionable.

Ortho-monobromphenol, also called Bromo-phenol, is a violet-coloured liquid used as an application (2 per cent. ointment) in erysipelas (see under Para-Monochlorphenol).

Orthoform is a new synthetic compound introduced by Einhorn and Heinz, who, from a study of the way in which the cocaine molecule was built up, arrived at the conclusion that the anæsthetic quality depended upon some influence existing in the hydro-aromatic ring. Orthoform is a white, bulky, odourless crystalline powder (p-methylamido-m-oxybenzoic acid), which is sparingly soluble in water. The hydrochloride is more soluble, but irritates somewhat. Yonge has reported at length upon this new anæsthetic, and claims for it several advantages—(1) it is sparingly soluble, hence its action is very prolonged; (2) it is non-toxic; (3) it is powerfully antiseptic. On the other hand it has no action on the unbroken skin and little on a healthy

mucous membrane, its effects being only strikingly shown where there are nerve endings exposed. The powdered orthoform may be freely sprinkled over abraded areas alone or mixed with lycopodium, and Yonge has applied it with success in ulcerations of the upper air passages not requiring operative measures. A 10 per cent. ointment, or a 10 per cent. solution of the hydrochloride, or a 5 per cent. spray of the latter may be used. Good results have been obtained by 15 grs. given in cancer and ulcer of the stomach when the relief of pain is said to have lasted from 4 to 30 hours. It has also given satisfaction in gonorrhœa, gynæcological practice, cystitis, burns, and a host of other painful conditions. It is perfectly harmless, and as much as 2 ozs. have been administered in seven days without any untoward effects.

Osmic Acid. (See Acid. Osmicum.)

Ouabain is the name of a crystalline glucoside extracted from the Somali arrow poison of Eastern Africa. The poison has been investigated by Arnaud, Varigny, Langlois, and Gley, who find that it contains a glucoside obtained from the wood of a tree belonging to the Apocyneæ family. This has been determined by Poisson to be the Akocanthera Ouabaio. The glucoside is believed by Arnaud to be identical with strophanthin, and acts powerfully upon the respiratory and cardiac centres. It is, however, stated to be twice as poisonous and twice as rapid as the glucoside from strophanthus. It is expected that it will replace other members of the same order, especially as it exists in the chips and sawings of the timber, and can be produced cheaply and in great abundance. $\frac{1}{1200}$ grain kills a guinea-pig in less than half an hour. Like strophanthin, it acts more slowly when taken by the stomach.

Gemmell recommended this glucoside in whooping-cough, and he claimed for it that it shortened the first and second stages of the disease, and diminished the length of the convalescent stage, in doses of $\frac{1}{1000}$ grain to children 5 years old ; in some cases he increased the dose to $\frac{1}{250}$ grain.

There is much confusion about this remedy, and Merck has changed the name of Lewin's Ouabain to Ouabaid, to prevent its being mistaken for this ouabain of Arnaud's. Commercial ouabain is also obtained from strophanthus glabrus from Gaboon. Fraser's crystalline glucoside is obtained from Akocanthera Schimperi ; it is identical with Arnaud's, and he proposes to call them both Akocantherin instead of Ouabain.

Oxalic Acid is a powerful poison acting upon the nerve centres, and upon the heart, and often exerting corrosive action upon the coating of the stomach. Poulet has discovered that it is a valuable emmenagogue in amenorrhœa in ½ gr. doses. He

uses the acid also in cases of excitement of the respiratory centre, as in dyspnœa and asthma.

Oxoles are solutions of Camphor, of Menthol, and of Naphthol in 3 per cent. peroxide of hydrogen solution and 35 per cent. alcohol. Camphoroxol and Menthoxol are each 1 per cent., while Naphthoxol is of the strength of 2 per cent. They are used (1 in 10 of water) as antiseptics for wounds and suppurating sores.

Oxygen—Lashkevitch has shown that oxygen has the power of markedly lowering excited reflex action; it has since been successfully employed in puerperal eclampsia, and Favr is sanguine that its use in every lying-in hospital will be soon a matter of routine when symptoms of convulsions appear.

Kirnberger has successfully tried it in leukæmia. Teissier advises the injection of oxygen into the peritoneal cavity in ascites.

Galan has recorded the successful use of oxygen inhalation in cases of severe and very extensive burns interfering with the cutaneous respiration; 70 litres per day were used, and good results have followed the use of oxygenated baths in similar cases.

Dujardin-Beaumetz introduced syphons of water and lemonade charged with oxygen gas (instead of carbonic acid), which he has found beneficial in dyspepsia and diabetes. The writer in 1874 tried ozone for the relief of acute suffocative bronchitis, but found that the relief afforded by the first few moments of inhalation was more than counterbalanced by the increased embarrassment of the breathing which supervened.

Good reports are forthcoming of its use in bronchitis, pneumonia, cardiac diseases, phthisis, pleurisy, and morphine poisoning.

Kellogg has urged the use of enemata of oxygen 2 litres daily in lithiasis, and states that much more of the gas is absorbed from the rectum than by inhalation.

The writer believes that he has saved life by inhalations of oxygen in coal gas poisoning. The compressed gas is supplied in metal cylinders, from which a rubber bag can be filled as required, and the patient slowly inhales from the bag one or more pints at a time. A small jet of the gas has been found to produce remarkable improvement in slowly healing ulcers and foul wounds, and Stoker's plan of treating chronic ulcers with diluted oxygen has given most valuable results; he shows that the resulting cicatrix is superior to that obtained in any other way. Ulcers healed readily after 25 years' failure with other agents.

Oxysparteine—The hydrochlorate of this oxidation product

of sparteine is very suitable for hypodermic injection, and it possesses all the therapeutic actions of sparteine in failing compensation and cardiac weakness, only that it acts with great rapidity. It may be given in doses of ½ to 1 grain in 10 per cent. solution.

Langlois has strongly recommended this drug as a *preventive* of cardiac failure in chloroform narcosis. He injects ½ gr. with ⅛ gr. morphine one hour before operation.

Ozonic Ether. (See under Hydrogen Peroxidum, page 399).

Pancreatin. (See page 427).

Pangaduine is the name given by Bouillot to a solid crystalline body, which he maintains represents the entire group of alkaloids found in cod liver oil. It is claimed for it that in daily doses of 5 grs. (representing 5 ozs. of the oil) it increases the amount and density of the urine owing to the increased elimination of urea. It is recommended in neurasthenia, phthisis, gout, gravel, &c.

Pao Pereiro, or Geissospermum læve, is a stately Brazilian Apocynaceous forest tree. An alkaloid called Pereirine or Geissospermine has been obtained from it, which has been used as a substitute for quinine in malaria. It reduces the temperature, acting at the same time as a tonic, and diminishing the frequency of the heart beats without weakening that organ. The hydrochlorate of the alkaloid, according to B-Limousin, may be given in doses of 30 grains in rebellious malarious fevers. A decoction of 1 oz. of the bark in a quart of water may be given in wineglassful doses. Tiberica affirms that it has twice the therapeutic value of quinine.

Papain and Papayotin—Papain is the soluble ferment prepared from the juice of *Carica papaya* by precipitation with alcohol; it is in the form of a white powder. It possesses the remarkable power of digesting animal substances; 1 gr. will peptonise 200 grs. pressed blood fibrin. Papayotin is, strictly speaking, the milky juice obtained by incisions made into the unripe fruit, collected and dried. The words papain and papayotin are, however, often used synonymously. In the West Indies the papaw juice is used to render the toughest meat quite soft and digestible.

Finkler, with properly prepared papain, has recently produced far better results than with pepsin, especially in the case of concentrated foods, and markedly so when the reaction is alkaline or neutral, as it often is in diseased stomachs, in which cases pepsin would be worthless. It also acts well in an acid medium. Moreover, the action of papain continues all down the intestines, whilst that of pepsin ceases in contact with the alkaline juices,

and the drug has a certain amount of anodyne or pain-relieving power. It has also been used as a remedy against round and tape worms, which it sometimes has destroyed by its digestive action. It has been used with varying success as a local remedy in diphtheria, where its application as a powder causes the disintegration of the false membrane. It has also been employed to destroy warts, epitheliomas, &c. Schwimmer has successfully used a solution (1 in 10) to cure fissures of the tongue. It is a powerful galactagogue when given internally, or even applied locally. The writer has satisfied himself of the great value of Finkler's papain in dyspepsia, chronic gastritis, ulcer, and cancer of the stomach in doses of 2 to 3 grains. He obtains such excellent results with the drug that he seldom now uses pepsin. He combines it with dried carbonate of soda, carbonate of bismuth, and a little morphia. There is no other combination which will give so good results in gastric affections as this :—

℞. *Papain (Finkler)* *gr.* iii.
Soaii Bicarb. *gr.* xxx.
Mag. Carb. Pon. *gr.* xx.
Bismuthi Carb. *gr.* x.
Morph. Hyd. *gr.* $\frac{1}{16}$. *Misce.*
Fiat pulvis. *St.* i. *ter die ex paul. aquæ p. cib.*

There is also contained in the leaves a poisonous alkaloid called Carpaine. (See page 515.)

Papaverine is one of the colourless, crystalline alkaloids of opium. Owing to impurities and difficulties in isolating these alkaloids, the greatest diversity of opinion exists about their action. Thus the ordinary dose of this substance is given at $\frac{1}{8}$ gr. Hoffmann affirmed he took 50 times this quantity without experiencing any effects whatever. Fronmüller states that it is narcotic, and that it dilates the pupil, and does not affect pulse, temperature, or respiration. Other observers find it markedly diminishes these. Leubuscher employs it in $\frac{1}{12}$ to $\frac{1}{2}$ gr. doses in the diarrhœa of children owing to its power of diminishing the intestinal movements. The dose of Merck's crystalline alkaloid is $\frac{1}{12}$ to $\frac{1}{3}$ gr.

Paracotoin. (See Coto.)

Para-Formic Aldehyde, sometimes called Paraform or Polymeriform, is the polymerized form of formic aldehyde or Formalin (which see). It is extolled by Aronson as a valuable

intestinal antiseptic. It exists as a white crystalline powder, and may be given in doses of 10 to 15 grs. in diarrhœa, &c., wherever salol is indicated; later observers report that it causes colic. A substitute for salol is desirable, as this drug has been found to produce concretions or calculi in the stomach and intestines. Paraform has been used as a disinfectant for catheters. It is also known as Triformal and Trioxymethylene.

Para-Monochlorphenol is a crystalline salt, which Karpow affirms is the potent antiseptic of the aromatic series. It is often called Chlorphenol,* and has given brilliant results as an ointment (10 gr. to 1 oz.) applied to erysipelas. It reduces the temperature, and in a few days all redness and swelling disappear. Ortho-monobromphenol acts in the same way, and may be used in the same strength. 5—20 per cent. solutions of mono-chlorphenol in glycerin have been applied by Simanoffski in tubercular ulcerations of the throat and larynx. Elsenberg paints the melted drug (104°F.) on lupus, and dresses the ulcer with a 25 per cent. paste or ointment, which is removed after 12 hours. Recently Brilliantoff treats corneal ulcers and iritis by injecting a 1 per cent. solution under the conjunctiva, and Köhler obtained excellent results by plugging the putrid pulp cavities of teeth with the drug. 2 per cent. solutions are recommended as the best means of disinfecting tubercular sputa. The salicylates of parachlorphenol and orthochlorphenol, called respectively Parachlorsalol and Chlorsalol, are used as intestinal antiseptics in 20 gr. doses.

Paroleine is the name given to a fluid, odourless petroleum, like Deelinæ oleum (which see), Paraffinum Liquidum, and Glymol. It is used as a solvent for cocaine, menthol, iodoform, and other drugs applied as sprays to the larynx, or as a basis like Vaseline or Adepsine oils for hypodermic injections of mercurials, alkaloids, and other substances. Terrol and Terraline are fluid, odourless petroleums, administered as substitutes for cod-liver oil.

Parrish's Syrup (Syr. Ferri Phos. Co.) is one of the best known and most extensively employed of Non-Official Remedies. It is known as "Chemical food," and is a valuable and agreeable method whereby the virtues of iron are combined with the restorative action of calcium and other salts. Each fluid drachm contains:—

Phosphates of iron, 1 gr.; of calcium, $2\frac{1}{2}$ grs.; of sodium, $\frac{1}{12}$ gr., and potassium, $\frac{1}{5}$ gr. Dose—1 to 2 drs., diluted.

The B.P.C. formula is about half this strength.

*Under the name Chlorphenol is described by Helbing a liquid consisting of probably orthomonochlorphenol, alcohol, eugenol, and menthol for inhalation in phthisis.

Pelletierine is a liquid alkaloid named after the great French chemist; it is obtained from the bark of the pomegranate. It was first called Punicin, a name still insisted upon by Binz. The bark contains four alkaloids or pelletierines, only two of which are possessed of any anthelmintic action, and it is chiefly Pelletierine sulphate and tannate which are used in medicine in doses of 6 grs. each. Von Schröder has demonstrated the action of this remedy outside the body upon living specimens of tænia serrata; he found the addition of $\frac{1}{10000}$ part of pelletierine to the fluid containing the parasites caused their death in a few minutes. Out of 88 cases of tape worm, treated in the Paris hospitals, Binz states that 82 were successful, *i.e.*, the head was expelled, but this result was only obtained when 6—7½ grs. tannin was administered with the same quantity of sulphate of pelletierine. When tannin is not given the soluble sulphate is absorbed in the stomach and fails to kill the worm, and giddiness, dimness of vision, muscular weakness, and twitchings are noticed, which do not follow the dose of the mixed substances.

The drug has been injected in Menière's disease, tetanus, and paralysis. A smart purge of jalap should be given after the anthelmintic dose to expel the dead worm.

Pellotine. (See Anhalonium, page 495).

Penghawar Djambé, or **Paku-Kidang,** consists of the silky hairs from the stems of a large variety of ferns in Sumatra, Java, China, India, and other tropical regions. It comes chiefly from Java, and has been known and used there for centuries. A portion of the hairy mass laid upon a bleeding wound almost instantly causes coagulation of the blood like the puff-ball.

Pental is a colourless mobile, volatile, and inflammable liquid. It is isomeric with Amylene (Tri-methyl-ethylene). It is introduced as a general anæsthetic, chiefly in dental practice, where the rapidity of its action and the short duration of its anæsthesia are advantages; it is administered on a mask like chloroform, or preferably by means of Junker's apparatus. Like every new anæsthetic, it was vaunted as absolutely safe, but already several deaths have been attributed to it, and it causes albuminuria.

Periplœin is a glucoside from the bark of Periplœa græca (Asclepiadeæ) introduced by Levaschoff as a valuable cardiac tonic, possessing all the virtues of digitalis. It is soluble in water, and promises to supersede digitalin for hypodermic injection. The maximum daily dose is $\frac{1}{64}$ grain. From the report in the B. M. J., May 14, 1898, this drug promises well.

Peronin is a white soluble powder, being Benzylmorphine hydrochloride introduced by Mering as a narcotic less objectionable than morphia. It induces sound sleep without previous excitement, and it relieves pain with less of the drawbacks

following morphia. The dose is from 2 to 3 times that of morphia (½ to 1 gr.), and it is very suitable as a sedative to the respiratory centre in the cough of various diseases, especially of tuberculosis.

Petroleum, or Rock Oil, found in geological strata, and resulting from the decomposition of animal matter, is chiefly of interest on account of the large number of bodies derived from it, and which have a place amongst remedial agents. Thus Naphtha is the liquid portion which distills over below 122° F.; from this are obtained by fractional distillation still more volatile liquids known as Benzin and Rhigolene, &c. Vaseline, Petrolatum, or Soft Paraffin, is the semi-solid mixture of hydrocarbons, which is obtained by purifying the residue after distilling off the naphtha and benzin liquids (see page 262).

A fluid vaseline is obtained from it, which is used as a vehicle for hypodermic injections, and as a spray in laryngeal troubles (see under Paroleine).

Liquid paraffin is now official. The pure liquid paraffins are demulcents, and are used as the basis of various popular cough emulsions.

Petroleum is a popular counter-irritant in rheumatism, and an antiparasitic remedy in various skin diseases. It is a valuable stimulant to the scalp in baldness, alone or diluted with 2 to 5 times its volume of any oil. The writer uses a mixture of 1 part of petroleum and 3 of olive oil as a routine application to the hair of the head in Charity Schools to destroy pediculi, as well as to prevent their appearance in the heads of the children.

Petroselinum or Parsley. (See Apiol.)

Phenocoll is a new antipyretic closely allied to phenacetin. The hydrochloride is a white crystalline powder (1 dr. dissolving in 2 ozs. water). Kobert, Mering, and others have carefully tested the action of this drug and find that it is a speedy, safe, and reliable antipyretic and analgesic, no unpleasant symptoms following very large doses. Its virtues have been demonstrated in acute rheumatism, typhoid fever, phthisis, and neuralgia, in doses of 8 grs., which Mering states are equivalent in therapeutic value to almost double this amount of antipyrine. The drug has steadily gained in favour since its introduction, and it is claimed for it that it is the best and safest of the analgesics. In malaria numerous reports show that it is equal to quinine without its drawbacks. It can be freely sprinkled over wounds and ulcers as a substitute for iodoform, and it is also stated to be an intestinal antiseptic, but it is probably too soluble to have any local action. It has given excellent results in whooping-cough. Salocoll is the salicylate of phenocoll, and is recommended in

rheumatism; it is less soluble, and may be taken in wafers in doses of 15 grs.

Phenosalyl is a new antiseptic, consisting of 90 parts carbolic acid, 10 salicylic acid, 20 lactic acid, and 1 menthol. It is a mixture introduced by Christmas. It is said also to contain some eucalyptol. It has been recommended as a lotion for wounds (1 per cent.) and as a carminative or gastric antiseptic, in doses of 1 to 2 minims.

Phenylhydrasin is a white caustic crystalline body derived from hydrazin; it is the bases of many new analgesics and antipyretics as antipyrine, &c. It cannot itself be turned to therapeutic account, but it is used as a test for sugar.

Phenyl-Urethane. (See Euphorine.)

Phesin is a pale, brownish-yellow, amorphous soluble powder without odour, and with a strong saline taste. It is a derivative of phenacetin, and it acts in the same way, only more promptly, and like every drug introduced as an antipyretic it is vaunted as being absolutely devoid of toxicity, in doses the same as phenacetin.

Phloridzin is a glucoside, existing in silky crystals, obtained from the bark of the apple, cherry, pear, and plum tree. It is of interest chiefly owing to its being employed in the physiological laboratory, as an agent, which readily produces glycosuria or diabetes of short duration. It is said to be antiperiodic, and has been used in ague, like quinine, in similar doses.

Photoxylin is introduced by Wahl as a substitute for collodion in surgical practice. It may be prepared by nitrating wood-pulp in the same way as cotton-wool is treated in its manufacture into gun-cotton; the resulting nitro-cellulose (3 to 5 parts) is dissolved in ether (100 parts). The film left when the ether evaporates is tougher and stronger than that left by collodion. It is used as a dressing for wounds and cuts, and Guranowski has achieved much success with it in cases of perforated tympanum, by painting over the edges of the aperture till it is completely closed. It forms a film impervious to moisture.

Phytolacca Decandra, or Poke Plant, is one of the innumerable indigenous American plants vaunted as a remedy for very many diseases. Thus it is affirmed to be a specific in chronic rheumatism, scrofula, and syphilis, many skin affections, diphtheria, and inflammations of the mammary and thyroid glands. How it is supposed to act in these widely different affections no one has attempted to explain. It is in full doses narcotic and emetic, and produces purging, and has been given in bronchial troubles. It appears at the best a rather

dangerous remedy, and should not be given in doses of more than 5 to 10 minims liquid extract (1 in 1). The powdered root has been applied to burns and eczema (1 to 8 lard). The powdered extractive known as Phytolaccin has been used as a cholagogue in liver diseases in doses of 2 to 3 grs.

Pichi, or Fabiana imbricata, has been tried in a number of diseases since Rusby and Ramires have reported upon it. It consists of the young branches, which they have found to be powerfully diuretic and tonic. Its use is contra-indicated in advanced renal diseases. In chronic catarrh of the bladder and in cystitis, accompanied by calculi and gravel, this drug has been much prized in Chili, and Fenwick found it to possess considerable power over the hæmaturia and pain in renal calculus. Shoemaker states that, given in combination with an alkali, it holds uric acid in solution, and it is thought that its resin dissolves the mucus which binds together the particles of a stone, leading to disintegration and facilitating expulsion. It has been given in nocturnal enuresis. Dose of fluid extract (1 in 1), ½ to 1 dr.; in infusion (1 in 20), 2 ozs.

Piper Methysticum. (See Kava Kava.)

Piperazine is a body occurring in colourless, acicular crystals, very soluble in water, prepared synthetically from ethylenediamine, and is known as Ethylenimine, Diethylendiamine or Dispermine. Its formula is $C_4H_{10}N_2$. It was at first introduced under the name Spermine, having been considered to be identical with that body, but it has nothing in common with it.

It behaves in a remarkable manner with uric acid. In cold aqueous solution it dissolves *twelve* times as much uric acid as carbonate of lithium does under identical conditions, and the piperazine-uric acid compound is seven times more soluble than the lithium-uric acid combination. It is claimed that 1 part of piperazine and 1 part of uric acid dissolve in less than 1 drachm of water, whilst it requires nearly 1 ounce of water to dissolve the same quantity of uric acid lithium (the exact proportions being 50 and 368 parts). Even when the uric acid is in great excess piperazine forms the very soluble neutral salt, and never an acid salt.

An injection into the bladder has been recommended as a solvent of uric acid calculi.

It is non-caustic and harmless, and may be given hypodermically in doses of 5 grs., or by the mouth 6 grs., three times a day in a large quantity of plain or aerated water. According to the reports of many observers it has proved a valuable solvent for uric acid calculi. Vogt found that 15 grs. three times a day markedly increased the amount of urea and diminished the amount of uric acid in the urine; it also increases the quantity of urine passed

In gout the value of the drug has been proved by reports of many authorities. The pain, heat, redness, and swelling of the joint soon subside, and old chalk deposits disappear. (See also under Lycetol.) A compound containing lithium, under the name Lithio-piperazine, is taken in doses of 10 grs.

Pilocarpinæ Carbolas is a colourless, oily fluid, which has been used by Edson with the view of introducing phenol into the blood. He maintains that, in addition to its expectorant qualities, it produces leucocytosis in phthisis. He uses a solution called Aseptoline, consisting of 1 gr. of carbolate of pilocarpine in 10 ozs. carbolic acid solution (2·75 per cent.) About 1 dr. of this is injected into the abdominal wall.

This treatment is vaunted to cure malaria also, and that more effectually than quinine.

Piperine is the alkaloidal substance obtained from *Pip. longum* and *nigrum*, in colourless or pale yellow, odourless crystals, which has been recommended as a substitute for quinine in the treatment of intermittent fevers. It has, however, been supposed that its antiperiodic virtues depend upon impurities. It is, nevertheless, decidedly antipyretic. It possesses all the therapeutic virtues of pepper, and has been given in gonorrhœa, dyspepsia, hæmorrhoids, &c., in doses of 5 to 15 grs.

Piperonal, or Piperonylic acid aldehyde, or Heliotropin, exists as fine prismatic, colourless crystals, with a strong vanilla-like odour, which are insoluble in water. It is obtained by the oxidation of piperine, and is a powerful antiseptic, though harmless, and may be given in doses of 15 to 45 grs. in wafers.

Piscidia Erythrina, or Jamaica Dogwood, has been used as a substitute for opium ; it causes sleep in moderate doses, which is not followed by any of the after ill effects of opium. It relieves pain, and it appears sometimes to act as a specific in sciatica and neuralgia, though it is generally experienced that its anodyne influence is less than that of opium, whilst its hypnotic power is greater. For insomnia it has been used in America. It relieves cough and spasm without affecting the centres like opium ; and it has been reported upon favourably in phthisis, bronchitis, and whooping-cough. In addition to its anodyne and hypnotic qualities, it causes salivation and diaphoresis, and dilates the pupil. It is the bark of the root which should be employed, and of the fluid extract (1 in 1) from 40 to 60 minim doses may be given. It should be commenced with caution as untoward effects have already been noticed, and it appears to be uneven in its action on different people. There is a resinous granular body known as Piscidin, a dry alcoholic extract, which may be given in ½ gr. doses. The drug has not realised what its supporters have published about it.

Propione, or Di-ethyl-ketone, is recently recommended as a powerful hypnotic in maniacal excitement by Giovanni, who gives it in doses up to 50 minims dissolved in 1 oz. aq. menth. pip. The ordinary hypnotic dose being, according to Merck, about 10 minims. It is a limpid liquid.

Protargol is one of the most recent and most highly vaunted remedies for acute gonorrhœa. It is a "chemical compound of silver and a protein substance," and contains 8·3 per cent. silver. It is very soluble and highly penetrating, and is not precipitated by albumen, and is practically non-irritating. The reports of Neisser, Goldenberg, Strauss, and many others, show that it is a very efficacious remedy when injected in $\frac{1}{2}$ per cent. solution three times a day, increased to 2 per cent. Some authorities affirm that it surpasses argentamin and all other known agents. It is a powerful antiseptic, and has been employed as a dusting powder for wounds of all kinds.

Protogen is the name given to a soluble albuminous compound produced by Blum from the action of formaldehyde upon egg albumen. It is a dry, yellow powder, called also Ova-protogen, and is introduced as an easily assimilated food in various gastric affections; it may be given in 1 oz. doses in enema. Protogens are also prepared from milk, serum, &c., and are recommended in the milk feeding of infants.

Pulsatilla, or Meadow Anemone—Under this name are included *Anemone Pulsatilla*, *A. pratensis*, and *A. patens*. Shapter concludes that it acts by controlling irritability and over-activity of the ganglionic nervous system, and has no claim, except indirectly, to be classed with hellebore and aconite as a vascular sedative. He has employed it in eclampsia from various causes, and found it beneficial. Clarus found that it poisoned in large doses by causing vomiting and purging, with bloody urine and paralysis of respiration, cord, and medulla.

It has been given with success in spasmodic catarrhal affections of the bronchi, as asthma and pertussis, and in spasmodic dysmenorrhœa, amenorrhœa, neuralgia, and many other affections. In catarrhal affections of all the mucous surfaces in *small* doses it is a valuable remedy. In acute epididymitis, 2 minim doses of the tincture every 2 hours have given good results. The fresh leaves are powerfully irritant, and may even blister the skin when applied to the sound cuticle.

Shoemaker states that pulsatilla has been used principally by irregular practitioners, and that at present it can scarcely be said to have any status in scientific medicine.

Anemonin, its active principle, may be given in doses of $\frac{1}{20}$ gr. in pill, or the tincture (1 to 8) 2 to 5 minims in water.

Pyoktanin. (See Methyl-Violet.)

Pyramidon is a white tasteless powder, being a substitution compound of antipyrine. It is Dimethylamidophenyl-dimethyl-pyrazolon. Its action may be regarded as almost identical in doses of one-third of those of antipyrine. 5 grs. will dissolve in 1 dr. of water, and may be given as an average dose in migraine, neuralgia, &c. Recent reports show that this new antipyretic has a very good promise of usefulness before it. Thus the fall in the temperature produced by it is more gradual and of longer duration than in the case of antipyrine, and in phthisis it is found that one daily dose of 8 or 10 grs. will prove enough to regulate the fever heat for considerable periods. 45 grs. may, however, be given in one day with safety.

Pyrantin is Para-Ethoxyphenyl-succinimide, and its sodium salt is called Soluble Pyrantin. It is an antipyretic, and like every new member of the group it is heralded by the statement that it reduces fever heat without any drawback. It is given in 5—10 grs. every 4 hours in acute rheumatism, and it has been tried in tubercular disease, but with disappointing results.

Pyridin is a substance existing in tobacco smoke, and which may be obtained by the dry distillation of nitrogenous carbon compounds, or by the action of sulphuric acid upon bone-oil and subsequent fractional distillation ; it is also one of the coal-tar products. It is supposed to be the active principle formed on the ignition of the various asthma cures. Merck's Pyridin is a colourless, powerfully-smelling liquid. It has been used with striking benefit in asthma. The vapour being inhaled after spontaneous evaporation, in a few minutes the breathing becomes easy, the pulse falls, and sleep follows. In chronic cases the patient may spend ½ an hour in a small room where 3j. pyridin is placed on a plate three times a day. It is also used in angina and pertussis, and an injection (1 minim in 5 ozs.) has been used in gonorrhœa.

This substance is not to be confused with Pyrodin, which is an antipyretic containing 25 per cent. of hydracetin.

Pyrodin. (See under Hydracetin.)

Pyrogallol Oxide (for Acid. Pyrogallic., see page 488)—It has been recently proved that the action of pyrogallol depends upon the acid being first converted into an oxide, and if this be done before it is applied to psoriasis and chronic eczema, these are speedily cured without the blackening and formidable inflammation which are barriers to its use. Hence the introduction of pyrogallol oxide, which is a brown powder obtained by oxidising the acid. It is claimed for it that it is non-poisonous and non-irritating, and does not discolour the urine when applied in the form of a lotion or ointment 1 in 10. Unna has

obtained most satisfactory results with the oxide of pyrogallol in leprosy. He rubs in an ointment over the entire body of 5 parts of this drug, 6 of salicylic acid, and 90 of lanoline. 40 grs. of the oxide were given internally each day in syrup, and remarkable improvement resulted.

Under the name of Oxide of Chrysarobin, Unna has introduced a black powder which he prepares from chrysarobin by acting on it with sodium peroxide. It has, however, little action upon psoriasis, and he advises its application to the face in eczema and rosacea.

Quebracho. (See Aspidospermine, page 503.)

Quinaphthol is a yellow crystalline powder, being the B.-Naphthosulphonate of quinine. Riegler finds this to be the best of all intestinal antiseptics. It passes through the stomach unaltered, and is split up in the duodenum. His results in typhoid are brilliant. It is claimed for it to be perfectly harmless, and may be frequently given in cachets, in doses of 10 grs. It has been recommended in tubercular peritonitis and acute rheumatism.

Quinetum consists of a mixture of the alkaloids obtained from the red cinchona bark. It possesses all the properties of the bark; its astringency is, however, feeble. It is a cheap substitute for quinine, and has been used in ague, fevers, and all affections in which quinine has been valuable. It is not so presentable as quinine, owing to its dirty white appearance. The sulphate of quinetum, however, is a more elegant preparation, and may be given in the same doses as quinine.

Quinine Salts—Helbing gives a list of 31 new salts of quinine, and states that it is doubtful whether more than one or two of them will obtain a permanent place in materia medica. There are probably twice as many more that have been tried and found wanting.

Quinidinæ Sulphas is the neutral sulphate of an alkaloid prepared chiefly from *C. Pitayensis*, in white silky crystals, not so bitter as quinine, and less expensive. This salt is very suitable for administration to children, who do not object to its taste so much as to quinine. The Tannate has identical action and is almost tasteless.

It is a valuable antipyretic and antiperiodic.

Dose—Same as quinine, but it is chiefly used when large doses (20 grs.) are required to bring down fever heat in rheumatism, typhus, typhoid, and pneumonia.

Quininæ Albuminas is a white amorphous substance with alkaline reaction, soluble in water, and containing, according to B-Limousin, 54 per cent. of quinine and 46 of albumen.

Quininæ Ferri-Chloridum exists in reddish, brown, soluble scales or powder ; it is introduced as a valuable hæmostatic in hæmorrhages in doses of 3 grs. four or six times a day in wafers.

Quininæ Hydrochlorsulphas and the Hydrochlorphosphas are introduced as hypodermic salts, being soluble in their own weight of water.

The Fluoride is vaunted in 2 gr. doses for enlarged spleen, and

The Iodide, Acid Iodide, and Iodate in 2 to 5 gr. doses in tubercle and chronic rheumatism.

The Arseniate in $\frac{1}{4}$ gr. pills in malaria.

The Glycerophosphate is indicated in the obstinate neuralgia of chronic malaria in doses of 2 or 3 grs. four times a day.

Quininæ Hydrobromas exists in colourless, lustrous needles. 4 grs. dissolve in 1 dr. of water for hypodermic injection, which may be repeated every four hours without causing irritation.

The *Acid* hydrobromate of quinine (yellow crystals) is more soluble than the above, which is neutral. 1 dr. of water will dissolve 10 grs. of it. Where quinine cannot be given by the mouth this salt can be readily employed hypodermically. A very much smaller dose is necessary when injected into the subcutaneous tissue. It produces, whether taken by the mouth or injected, less unpleasant symptoms than the other quinine salts.

Quininæ Lactas has recently been shown by Vigier to be a salt very suitable for hypodermic administration in aqueous solution (1 in 8.)

Quininæ Salicylas—This salt meets a want which the physician frequently experiences when he wishes to combine quinine with salicylic acid or its salts in rheumatism. The method of prescribing salicylic acid in a mixture with quinine often leads to the formation of an incompatible mass, which accumulates in the mixture and adheres like wax to the sides of the phial. Salicylate of quinine exists as white silky needles very sparingly soluble in water ; it is best prescribed in the form of pills, 4 grs. each made up with Proctor's paste.

Quininæ Sulphocarbolas is a white powder, prepared by mixing hot solutions of sulphate of quinine and carbolic acid, and may be given in pill in doses of 2 to 8 grs.

Quininæ Tannas exists as a white, almost tasteless, amorphous, insoluble powder, prepared by decomposing sulphate of quinine solution with strong solution of tannic acid. It is recommended for children. Its dose corresponds to that of the sulphate, but it is nearly insoluble.

Quininæ Valerianas exists in white, lustrous crystals, smelling slightly of valerianic acid. In addition to the valuable properties of quinine, this salt possesses superior power over *neuralgia* in

hysterical patients. The dose should not exceed 3 grs., and should be given in pill.

Quininæ et Ureæ Hydrochloras is a soluble hydrochloride of urea and quinine salt, suitable for hypodermic injection; it contains over 60 per cent. quinine. It may be easily prepared by combining 3 parts of urea with 20 of hydrochlorate of quinine and 12 of hydrochloric acid. It dissolves in its own weight of cold distilled water, and the solution can be injected in 5 to 20 minim doses.

☞ These hypodermic salts are now superseded by the introduction of the acid hydrochlorate into the new B.P.; it dissolves in less than its own weight of water. Bacelli, for his solution for intravenous injection, gives 15 grs. with 11½ grs. sodii chlor. and 150 minims of water. The Bisulphate is only soluble 1 in 10, and hence is unsuitable. (See also Euquinine.)

Quinopyrine is a new, very soluble compound, containing 2 parts of antipyrine and 3 parts of quinine. It is soluble in 2 parts of water. It is recommended in doses of 20 grs. hypodermically in malaria. It is poisonous when given by the mouth, and some induration remains about the seat of the needle puncture, so that it is not likely ever to come into general use.

Quinosol. (See Chinosol.)

Renal Substance—Various preparations of kidney extract have been recently vaunted as specifics in albuminuria and other affections. Mois has, however, shown that in safe doses renal juice is valueless.

Resorbin is a new basis for ointments, introduced because of the readiness with which it is absorbed when rubbed in. It consists of almond oil, wax, soap, gelatin, and a little water and lanoline, and Hahn recommends a 33 per cent. mercury ointment made with it for the inunction treatment of syphilis.

Resorcin is Metadioxybenzol, occurring as a white crystalline powder. It was formerly prepared from gum ammoniacum and gum galbanum by fusing them with caustic potash; it is now prepared from benzol. It closely resembles carbolic acid in its properties, and is a powerful antiseptic. 1 in 100 prevents putrefaction; 2 in 100 is not irritating when applied to wounds. Given internally large doses (30 grs.) cause giddiness, dyspnœa, and perspiration; 60 grs. have caused collapse and coma and a fall of temperature. Its use as an antipyretic should be discontinued, as it is dangerous. 5 gr. doses have been given in ulcer of the stomach and in sea-sickness.

In the diarrhœa of children small doses (1 gr.) have achieved good results. It has been given in ague and asthma, but the large doses which are necessary are dangerous.

It acts as a local anæsthetic in laryngeal cases, and if applied in concentrated form it becomes a safe and painless caustic in tubercular laryngitis.

Externally or locally it possesses great absorptive powers over new cell infiltrations, as lupus, epitheliomas, &c. In labial epithelioma the powder causes speedy cicatrization, and even in uterine and rectal cancer benefit is for a time noticed when the powder is dusted over the growths, where it acts as an efficient painless cautery; the strong solution is also caustic. It has been proved useful in diphtheria; the powder may be applied to the throat, or a 50 per cent. solution may be used as a swab or spray. Excellent results have been obtained in whooping-cough by using a spray or painting the throat and fauces with a 1 to 2 per cent. aqueous solution. In both this disease and diphtheria it may be administered internally at the same time. A solution (1 in 50) may be injected into the bladder in cystitis, and a 1 to 2 per cent. solution may be used in ophthalmia, otitis, gonorrhœa, and leucorrhœa. Externally the same solution is of great value in chronic eczema, ulcers, wounds, and sores. 2 to 5 per cent. in erysipelas, and 20 per cent. in psoriasis and parasitic skin diseases have been valuable. Helbing points out that 1 to 3 per cent. solutions harden the skin, whilst 10 to 50 per cent. macerate and destroy it. It must be absolutely pure, and should be kept from the light.

Resorcinol is the name given to a brown powder formed by mixing and heating equal parts of resorcin and iodoform. It is introduced as a substitute for iodoform, and may be mixed with 3 or 4 times its weight of starch, and dusted over chancres and ulcers.

Resorcin-phthalein, or Fluoresceïn is a brownish red, crystalline powder. A 2 per cent. solution, with as much soda, stains green any denuded spots on the cornea, and is therefore used as a means of diagnosing corneal ulcers and foreign bodies.

Retinol. (See Rosinol.)

Rhigolene, or Amyl Hydride, is a light hydrocarbon obtained from petroleum, and used by Richardson to produce local anæsthesia. He found that 1 dr. of camphor and 1 of spermaceti dissolved in 2 ozs. of rhigolene applied on cotton wool to burns produced rapid relief from pain by its evaporation, and there was left a safe protective coating upon the injured surface which acted the part of an impervious dressing. Iodine dissolved in rhigolene, making a 1 per cent. solution, is used for chancres. Stabler found that the spray produced from a mixture of rhigolene and expressed oil was absolutely unirritating, and could be sprayed into the throat. He finds that all essential oils and turpentine, salol, menthol, &c., can be sprayed in this way.

The extreme inflammability and very unpleasant odour of rhigolene are the great drawbacks to its general use. It is also known under the names Hydramyl, Pentylene, and Pentyl Hydride, and enters into Amyl Colloid. The article supplied as Rhigolene is often impure.

Rhus Aromatica, or Fragrant Sumach, is an astringent, given in cystitis, hæmorrhage, night-sweats, hæmaturia, menorrhagia, diarrhœa, and dysentery. Its pharmacology is not clearly understood; it has some selective action upon the urinary tract; the resin which resides in the root-bark is eliminated by the kidneys. R. Glabra has similar action.

Excellent results have followed its administration for the nocturnal incontinence of urine. Unna declares that it is a specific for this condition, acting upon the muscular fibre of the bladder. Under 2 years he gives 5 minims of fluid extract night and morning, and between 2 and 10 years 10 minims; and continues its use after the symptoms disappear.

Rhus Toxicodendron, or Poison Ivy—The fresh leaves of this plant cause great cutaneous irritation and inflammation even upon slight contact in some people. Internally, in large doses similar action appears to be excited in the stomach and intestines, and even the emanations from the plant produce eczematous eruptions. It possesses properties like the preceding remedy, when given in minute doses—2 minims of tincture (1 to 8) diluted, and it has been administered for incontinence of urine and atony of the bladder; it has been given in rheumatism and paralysis, but is worthless in these diseases. Externally it has been used in rheumatism and eczema, and the juice has been applied as a caustic to hard cancers.

Plaff has separated the active principle of rhus in the form of an oil which he calls Toxicodendrin, and it has been suggested as a counter-irritant.

Rosinol, Retinol, or Resinol, is an oily hydrocarbon, with a faint, peculiar odour, non-saponifiable, and unirritating, obtained by the dry distillation of resin. It is powerfully antiseptic, and can be applied upon lint to ulcers and putrid sores, and to cancer of the uterus, &c.

With half its weight of lanoline it has been applied to the conjunctiva in catarrhal conditions, and used in eczema, impetigo, scabies, hæmorrhoids, &c. It has been brushed over the false membrane in diphtheria.

Internally it has been given in tea-spoonful doses in fevers, bronchitis, rheumatism, and gonorrhœa. Capsules afford the most convenient form for administration.

Its greatest value, however, lies in the fact that it can be mixed with a great number of drugs already found useful in skin

therapeutics, and it makes a stable, unirritating base for ointments. It dissolves phosphorus, Peruvian balsam, naphthol, camphor, salol, and many other agents.

Rubidium Salts are introduced as substitutes for the iodide and bromide of potassium in the treatment of syphilis and epilepsy. Being of greater molecular weight they are stated to be more active. They do not appear to possess any advantage over the sodium compounds, and, notwithstanding the praise given to them and to the rubidium ammonium bromide, they are never likely to come into general use. Rubidium iodide is given in doses of 2 to 5 grs., and the Bromide in doses of 5 to 10 grs.

Rumicin is the eclectic preparation obtained from *Rumex crispus*, or Yellow Dock. It is vaunted as possessing astringent and aperient qualities like rhubarb, and alterative and tonic virtues in doses of 2 to 5 grs., in pill. It contains chrysophanic acid, and has been given internally in psoriasis, chronic laryngitis, scrofula, dyspepsia, and hepatic diseases, and as an alterative astringent in diarrhœa.

Sabal, or Saw Palmetto, is a plant growing in the Southern States of N. America accredited with a long list of very marked therapeutic virtues in a host of ailments. It appears, however, to really possess expectorant properties, and has been given with benefit in various forms of bronchitis, nasal catarrh, asthma, phthisis, and laryngitis. Some idea of the difficulty in forming any opinion of the value of the reports upon this drug may be judged from the fact that it has been vaunted as a remedy for *atrophy* of the testicles and mammary glands, and *hypertrophy of* the prostate. Sabal is said to be the basis of Sanmetto, which also contains oil of sandal wood, used in cystitis and prostatic disease.

Safrol—Oil of sassafras consists of about 90 per cent. of this substance, the remaining 10 per cent. being terpene with a little eugenol. It is obtained in large quantities from Japanese camphor oil. Safrol has been given in doses of 20 to 30 drops in acute and subacute rheumatism and sciatica. Locally it acts like menthol.

Salacetol, or Salicyl-Acetol, is a compound of salicylic acid with acetol, in shining, flat, insoluble crystals. It is claimed to be an excellent intestinal antiseptic, and has been given in various forms of diarrhœa and in rheumatism. Bourget's method of treating diarrhœa is to give 30—45 grs. in 1 oz. castor oil before breakfast. It is stated to be non-poisonous.

Salbromalid, or Antinervin, is a colourless, crystalline powder, consisting of a mixture of salicylanilide and brom-acetanilide. The German preparation is obtained by mixing

bromide of ammonium 1, salicylic acid 1, and antifebrin 2. It is also known under the name of Salicylbromanilid, and it is claimed for it that it possesses the virtues of bromides, salicylic acid, and antifebrin in tabloids or wafers of 3 to 5 grs.

Salicylamide exists in small, tasteless, colourless crystals. It is the amide of salicylic acid obtained by acting upon the oil of wintergreen by strong ammonia. It acts like a concentrated salicylic acid, and is reputed to have a much stronger analgesic action. Its dose is only 5 grs., and this amount is soluble in about three table-spoonfuls of water. It is used in acute rheumatism and in migraine.

Salicyl-Guaiacol. (See Guaiacol Carbonate).

Saliformin, or Hexa-methylene-tetramine-salicylate, is a white, soluble, crystalline powder, introduced as a powerful antiseptic, and solvent for uric acid, preferable, according to Merck, to urotropin. It is given in one dose of 20 grs. in a large amount of water once daily.

Saligenin, or Salicylic Alcohol, exists in colourless scales, obtained by treating phenol with formic aldehyde. It is introduced as a substitute for salicylic acid in the treatment of acute rheumatism and other affections, and it is stated to be free from the drawbacks of salicylic acid. It may be given in doses of 10 grs. every two hours in powder. It is also known as Orthooxybenzyl alcohol.

Salinaphthol. (See Betol.)

Saliphen is the name given to salicyl-phenetidine, which was introduced as an analgesic, but it has not pain-relieving properties. It must not be confounded with Salophen, which see under Salol, page 458.

Salipyrine is a white, crystalline, odourless powder, prepared by the action of antipyrine upon salicylic acid; it is almost insoluble in water. It can be readily prepared by mixing a watery solution of antipyrine with an ethereal solution of salicylic acid. It has been recommended as a remedy in acute rheumatism and influenza. It has been used successfully in nearly every disease or feverish condition where antipyrine is indicated. Guttmann found it valuable also in chronic rheumatism and neuralgia, and he gave it in large doses for many days without witnessing any unpleasant effects, save an exanthematous eruption in one case. It may be given in tabloids or wafers in doses of 10 to 20 grs. three or four times a day. According to Guttmann it has only half the antipyretic strength of antipyrine. Recently it has been used with success by Zurhelle for menorrhagia. It is known as Antipyrine Salicylate.

Salix Nigra, or Black Willow, is used by H. Fenwick as a sexual sedative. It has been given in ovarian hyperæsthesia, seminal emissions, and urethral neuralgia. Paine and Hutchinson report most favourably upon its action as a sedative in uterine and ovarian pain, and in hemicrania, and excellent results have been obtained in facial neuralgia, hysteria, and nymphomania. The bark, root, and buds are made into a fluid extract 1 in 1, of which ½ to 1 dr. may be taken three times a day.

Salocoll. (See under Phenocoll.)

Salol Camphor. (See Salol, page 457.)

Salol Tribromide, or Cordol, is a colourless, tasteless, and odourless powder, which has been introduced by Rosenberg as a certain and safe hypnotic, in doses of 20 to 30 grs. He affirms that it has also pain relieving or analgesic qualities. It is also a powerful remote astringent, and stops hæmorrhages in a remarkable way. Probably when the action of this substance is worked out it may also be found to have some antipyretic action and, if so, it should prove invaluable in the hæmorrhage of typhoid fever and other allied conditions.

Salophen. (See under Salol, page 458.)

Salubrol is a stable powder, introduced as an iodoform substitute. It is methylene-di-antipyrine-bromide, and gives off bromine in contact with organic matter. It is stated to be non-toxic, but sometimes it causes pain, and is recommended as a 20 per cent. gauze.

Salumin is a reddish powder insoluble in water; it is a salicylate of aluminium, and is used for its astringent and antiseptic qualities as a powder insufflated in ozœna and other affections of the nasal membranes and pharynx.

There is a soluble compound salt with ammonia, which is used as an astringent gargle and lotion. The compounds act like Tannal. (See under Aluminium Aceto-tartrate.)

Sanatogen is a soluble and palatable sodium and casein glycerin phosphate, containing 13 per cent. nitrogen, being an undigested albuminous food. It may be given in soup in tea-spoonful doses, and Vis and Treupel report most favourably upon its nutritive value.

Sanatol is the name given to a dark-coloured acid disinfecting liquid, which consists of the ordinary creosols held in solution by strong sulphuric acid. It is not free from poisonous qualities, and cannot be taken internally, but it is a powerful disinfecting agent suitable in those cases where crude carbolic acid is useful, as for the sterilisation of typhoid fever excreta, &c.

Sanguinal is a preparation in the pilular form of fresh, defibrinated blood evaporated. It is claimed for it that it contains oxyhæmoglobin and all the blood salts with peptonised muscle albumen. It is vaunted as a remedy of great value in anæmia and chlorosis. Each pill contains the equivalent of more than one drachm of fresh blood.

Sanguinaria Canadensis, or Blood Root—The rhizome of this perennial plant has been found in full doses to act as a powerful emetic, causing purging, salivation, dilatation of the pupils, collapse, and death, preceded occasionally by convulsions, and a marked rise afterwards followed by a more marked fall in arterial tension and pulse. Reflex excitability, respiration, and muscular contractility are diminished.

Sanguinarin, the resinoid extractive, is a valuable stimulating expectorant in chronic bronchitis, and in small doses ($\frac{1}{12}$ to $\frac{1}{8}$ gr.) it acts without irritating the stomach. In still smaller doses ($\frac{1}{20}$ to $\frac{1}{12}$ gr.) it may be given for atonic dyspepsia, as it increases the secretions of the stomach and intestines. It has been tried in febrile conditions for its sedative action upon the vascular system, but, as it only acts in this way in full doses ($\frac{1}{2}$ to 1 gr. or more), which cause much irritation of the stomach, it is inferior to hellebore, aconite, and other remedies. It acts as an hepatic stimulant, and increases the flow of bile.

It also acts as an emmenagogue, and has been given in functional uterine ailments, but it is dangerous, and should be discarded for this purpose. The dose of the U.S.P. tincture is 30 minims, or of the fluid extract 5 minims.

Sanguinarine is the alkaloid, and its nitrate has similar action as an expectorant in doses of $\frac{1}{10}$ grain.

Sanoform, or Di-iodo-methyl-salicylic-ether, is a white, odourless powder, consisting of nearly two-thirds of its weight of iodine. It is stable and insoluble, and is introduced as a substitute for iodoform. It is stated to have wonderful desiccating properties, and is highly recommended in ophthalmic practice and as a remedy for ulcers. It is non-poisonous, and can be completely sterilised by heat without the danger of being decomposed. This property, with its absence of odour, gives it great advantages over iodoform.

Sanose is the name given to a very digestible and palatable white powder, devoid of odour, which is a mixture of 8 parts of casein and 2 parts of albumose. It can be used like nutrose as a food for typhoid and other patients, either mixed with milk or sprinkled over soup in the same way that the Italians use powdered Parmesan cheese.

Santoninoxim is a substance in white, silky crystals, soluble

in alcohol, which is prepared by heating 5 parts santonin, 4 parts hydrochlorate of hydroxylamine and 4 parts carbonate of calcium with alcohol. Upon filtering the boiling liquid, and adding 5 times its bulk of boiling water and cooling, this substance crystallizes out. Cappola claims that it can be given in doses three times as great as santonin without the risk of producing any toxic symptoms, and it kills the worm whilst santonin is said to only paralyse it.

Saponin. (See Quillaia Saponaria.)

Savonal is a new basis for medicated soaps in the form of a transparent green soap, prepared by saponifying olive oil with caustic potash, and adding hydrochloric acid and evaporating. It forms clear solutions with water, alcohol, and glycerin ; and Muller and Grube prefer it to all other known bases.

Scillain, or Scillitoxin, is a glucoside from squill, existing as a yellow powder, acting like digitalin in heart disease and dropsy, in doses of $\frac{1}{10}$ gr. (See Scilla.)

Scillipicrin is another principle found in squill, and it is suggested for hypodermic use in 10 times the dose of scillain.

Scoparin is an active principle extracted from broom and allied in its action to sparteine. It is, however, much more powerfully diuretic, and may be given in doses of 10 grs. *ter in die*, in cachet or pill, as it is almost insoluble in water. $\frac{1}{2}$ gr. dissolves in water with a little ammonia, and has been given hypodermically.

Scopola Carniolica has been used by Duckworth and others as a remedy for sweating and palpitation. It contains hyoscyamine, and is less objectionable than belladonna. The fluid extract may be given in 5 minim doses. The root has been recommended instead of belladonna for all the preparations usually made with belladonna. (See under Hyoscine with which the alkaloid scopolamine is identical).

Scopolamine. (See under Hyoscine, page 400.)

Senecio Jacobœa, or common ragwort, is recently reported by Murrell and others as a drug of great value in functional amenorrhœa. It is claimed for it that it always stimulates the menstrual function without having any tendency to produce abortion if pregnancy chances to exist in any case. The dose is 1 to 2 drs. four times daily of a 1 in 10 tincture of the entire plant, or up to 40 grs. daily of the solid extract may be given. S. aureus and S. gracilis appear to have the same action. The drug should be given for one week in every month till the function is restored. S. aureus is used in America as a hæmostatic in hæmorrhages from the kidney, lung, &c., in drachm doses of the liquid extract.

Sodium Glycocholate and Sodium Taurocholate. (See Bile Salts.)

Sodium Tellurate is a salt recommended in ½ grain doses in pill for the night sweats of phthisis. It gives the garlic odour observed after long courses of bismuth, and may produce colic and diarrhœa.

Sodium Hyposulphite (or Thiosulphite) is used as a lotion (10 per cent.) in tinea, chloasma, &c., and in doses of 5 grs. for flatulent dyspepsia and in dilatation of the stomach, and in doses of 40 to 60 grs. it is most valuable in gangrene of the lung.

Sodium Sozoiodol. (See under Sozoiodol.)

Sodium Peroxide is a white powder which dissolves in water, forming hydrogen peroxide, the nascent oxygen of which is a powerful bleaching agent. 50 per cent. solutions are used to bleach discoloured teeth and to disinfect putrid teeth cavities. The sodium hydrate, also formed on solution of the salt, plays an important part in the disinfecting action.

Solanin is a glucoside obtained from many solanaceous plants. It possesses decided analgesic and local anæsthetic action, and has been used hypodermically in sciatica. Firope found that it caused profound cerebral and spinal depression, producing anæsthesia and paralysis. It is recommended in all cases where it is necessary to reduce spinal irritability and in asthma. It should not be given hypodermically, as it causes local irritation. It has no effect upon the pupil or brain. There is much uncertainty about this remedy, and it is probable that different observers have been using different glucosides or alkaloids in different degrees of purity from various members of the solanaceæ. One writer lauds it as a valuable substitute for morphine, as it does not cause cerebral congestion, whilst another condemns it as uncertain and highly irritating to the tissues, and only analgesic in dangerous doses. One reporter gives it in doses of $\frac{1}{20}$ gr., whilst another administers 4 grs. The dose of Merck's crystalline preparation is ⅛—1 gr.

Solidago, or Golden Rod (Solidago odora), is a North American plant with a fragrant anise-like odour, which enjoys a popular reputation as a carminative and diaphoretic, and as an antispasmodic in dysmenorrhœa. The essential oil is the active principle of the plant, and may be given in doses of 2 to 4 minims.

Solidago Virgaurea resembles it in most respects and possesses diuretic properties which have rendered it useful in chronic cystitis and atony of the bladder, in which affections Dr. G. F. Wales has obtained good results from wine-glassful doses of an infusion (1 in 20) four times a day.

Solutol is an acid solution of sodium-cresol in excess of cresol (10 ozs. contain 6 ozs. cresol). It is a very valuable antiseptic. A ½ per cent. solution is as powerful as carbolic acid solution of 5 times this strength, and may be used for the disinfection of instruments of metal.

Solveol is a neutral solution of cresol in sodium creosotate, and has the same powerful antiseptic properties as solutol, and may be used in ·5 per cent. solution for similar purposes.

Somatose is a yellow powder, odourless and tasteless, and soluble in water, consisting of the albumoses of meat with traces only of peptones. It is an easily absorbed food, and a perfect substitute for albumen in cancer or ulcer of the stomach and in all wasting diseases, and it is a powerful galactagogue. It may be given in milk or soup in amounts of 1 oz. daily, or in doses of 1 to 2 drs. for children. Recent results prove that it is very valuable in the vomiting of pregnancy. Milk somatose with 5 per cent. tannin is vaunted as an ideal artificial food by Schmidt.

Somnal, or Ethyl-Chloral-Urethane, is a colourless liquid with a faint chloral-like odour, formed by the combination of alcohol, choral, and urethane. It was introduced by Radlauer, and has been proved to possess hypnotic qualities in doses of 30 to 40 minims in sherry or sweetened tincture.

Its effects begin in 30 minutes, and it produces sound refreshing sleep, lasting 6 or 8 hours. It is claimed for it that it does not interfere with the digestion, respiration, or circulation. It closely resembles chloral in its therapeutic action, but it yet remains to be demonstrated that it is free from the dangerous, depressing effects upon the heart.

Sozal is Para-phenolsulphonate of aluminium. (See under Alumnol.)

Sozoiodol, or Diiodparaphenolsulphonic Acid, is the name given to a new antiseptic in white crystals, devoid of odour. It is prepared by acting upon phenolsulphonic acid with iodine, and it contains 7 per cent. sulphur and 52 per cent. iodine. The substance used in medicine as sozoiodol is an acid sodium salt. There are also sozoiodols of potassium, of mercury, zinc, lead, ammonium, aluminium, silver, and barium ; several of these have been recommended and used as substitutes for iodoform.

Lassar has used sozoiodol in skin diseases, in a 5 per cent. powder, paste,* or ointment, with zinc, starch, and vaseline or lanoline, and finds that it rapidly cures chronic eczema, tinea, impetigo, and ulcers. It resembles, in his opinion, salicylic acid, but is less irritating. Other observers have utilised its powerful

*The substance known as Lassar's Paste does not contain sozoiodol. It consists of salicylic acid 2 parts, oxide of zinc 25 parts, powdered starch 25 parts, and vaseline 50 parts. It is very valuable in eczema.

antiseptic qualities in the treatment of lupus, gonorrhœa, syphilis, ozœna, and tubercular laryngitis. It has been employed in every case where iodoform has been tried, and may be freely dusted on all ulcerated surfaces alone or with talc ; 1 per cent. solution is used for bladder irrigation and as a spray in pertussis. It has been administered internally in stomach affections in doses of 15 grs. thrice daily, and it is claimed for it that, unlike iodoform, it is perfectly safe and non-poisonous.

Sparteine is the active principle of broom ; it is a colourless, liquid alkaloid, which forms crystallisable salts, and it is the sulphate which is generally administered in medicine. It is a cardiac tonic acting like digitalis, and it possesses one advantage over this drug in the *rapidity* of its action ; 1 gr. hypodermically shows its power over the heart in less than 30 minutes. It may be given where digitalis disagrees, or in the intermissions of a long digitalis course, in doses of 1 to 2 grs. *ter die.* It is a fair diuretic, but not so reliable as digitalis either as a diuretic or cardiac tonic. In urgent cases of dilatation or failing compensation it may be injected with strychnine.

Recently Guinard has pointed out the remarkable results obtainable by painting a 5 per cent. solution of the sulphate in water upon the skin, and covering with a light dressing. It acts like guaiacol, and reduces the temperature 2 or 3°F. His results are, however, denied by Lannois.

Quite a number of observers testify to the value of small doses ($\frac{1}{10}$ to $\frac{1}{2}$ gr.) hypodermically, 15 minutes before chloroform narcosis in patients with weak or diseased hearts.

Spermine—Poehl's preparation is a 2 per cent. sterilised solution of the chemical ferment, which is the active principle of Brown-Sequard's emulsion, prepared from the seminal glands of various animals, chiefly from the bull. It is given by deep injection in 15 minim doses. Poehl maintains that autointoxication arises in many conditions from the retention in the body of various decomposition products as leucomaines, &c., and that these in health are oxidised by the ferment spermine, which is produced by most glands as well as by the testicles. Hence the *rationale* of the injections in anæmia, neurasthenia, insanity, premature senile decay, phthisis, ataxy, psoriasis, diabetes, and a host of ailments. Glowing accounts of the benefits of a course of 12 or 14 daily injections in all the above diseased conditions have been published. The hydrochlorate and phosphate of spermine have been also administered, but the soluble 2 per cent. solution of Poehl is the best for all purposes. It unquestionably exercises a very marked influence over all the metabolic processes in the body. Dried testicular matter has been administered in the tabloid form by Schmidt.

Spleen Pulp was used by Maragliano in anæmia and chlorosis with benefit. He administered in 24 hours 4 ozs. spleen pulp, 2 ozs. brandy, and 10 ozs. almond emulsion. Since then others have administered a splenic extract made into pills, or a dried preparation in the tabloid form, prepared from the sheep or pig's spleen. Cohnstein, under the name of Eurythrol, administers a watery splenic extract for chlorosis. The tabloids have been given in malarial conditions and in exophthalmic goitre. In this latter disease several favourable reports have been published recently showing the value of spleen substance.

Steresol is an antiseptic varnish or collodion, introduced by Berlioz, in the form of a reddish liquid, containing lac, benzoin, tolu, phenol, and oil of chamomile. Several observers have reported good results from painting fresh wounds with it, also by applying it to eczema, herpes, burns, and diphtheria, &c.

Stillingia Sylvatica, or Queen's Root, has been used in America as an alterative in syphilis and struma.

It is a sialagogue, and when swallowed appears to increase the secretions of the gastric and intestinal glands by a mild irritant action; the liver is stimulated to secrete more bile, and if the dose be large, vomiting and purging supervene. The urine is increased, and the bronchial secretion is augmented.

It has been given in ascites, caused by cirrhosis, in hæmorrhoids, and in chronic constipation and jaundice, and in various strumous ailments.

Dose—Of the fluid extract (1 in 1) 20 minims to 1 dr., or of Stillingin (its eclectic extract) 2 to 4 grs.

The Compound Liquor, known as M'Dade's Succus Alterans, is used as an antisyphilitic agent, and, according to Martindale, consists of fluid extracts of smilax, stillingia, lappa minor (burdock), and phytolacca, of each 2 ozs.; and tincture of Xanthoxylum (prickly ash), 1 oz.; it is given in doses of 1 to 4 drs. three times a day.

Strontium—The lactate of strontium has been praised as an agent for albuminuria by D.-Beaumetz. It is stated upon good authority that this is the only drug which can be relied upon for this purpose. It may be given in doses of 20 to 30 grs. three times a day. The writer has tried it extensively, but failed to find that it did any good.

The bromide and iodide are introduced as substitutes for the corresponding potash and soda compounds, but there seems little to recommend them except that they produce less gastric derangement; the doses are the same. Laborde praises the phosphate as the most valuable restorative tonic. The nitrate is given in 30 gr. doses in rheumatism, and the carbonate is used as a dentifrice.

Strophanthin. (See Ouabain.)

Stypticin (Cotarnine hydrochloride, Merck) exists in yellow soluble crystals, obtained by oxidising narcotine. It is allied chemically and therapeutically with hydrastinine. It controls remote hæmorrhages, and has proved most satisfactory in menorrhagia when given by the mouth in $\frac{1}{2}$ gr. doses in capsules, or hypodermically in $\frac{1}{3}$ gr. 1 gr. dissolves in 10 mins. tincture of cinnamon, and half of this may be taken on sugar. It has also marked analgesic or soothing properties, and permanently reduces subinvolution, acting like ergot, though Marfori maintains that it has no vasoconstrictor action. Its best results are obtained in uterine hæmorrhages depending on ovarian changes. It is very valuable in uterine fibroids during the suspension of ergot, and may be employed in the hæmorrhage of uterine cancer.

Styracol is a crystalline substance in long needles ; it is the cinnamic acid ester of guaiacol, from which it is obtained. It is introduced as a substitute for guaiacol, being much more agreeable in odour and taste. It possesses powerful antiseptic properties, and has been given internally in chronic cystitis, gonorrhœa, phthisis, and catarrhs of the stomach and bowels, and in every condition in which creosote or guaiacol are indicated.

Sulphaminol, or Thio-oxydiphenylamine, is a yellow, tasteless, odourless powder, insoluble in water, prepared by the action of salts of metaoxydiphenylamine upon sulphur. It is claimed for it that it possesses all the virtues of iodoform without its objectionable qualities, and it is, moreover, perfectly harmless in enormous doses. Kobert gave very large quantities of this new antiseptic to dogs without being able to produce any unpleasant symptoms. In contact with pus and the secretions from wounds and sores it splits up into sulphur and phenic acid. Moritz used it as a dry dressing to suppurating wounds, and found it to act most powerfully in diminishing the discharge. It has also been used as an insufflation in laryngeal phthisis and nasal discharges, and it is reported that internally in doses of 4 grs. it has proved beneficial in cystitis and other ailments.

Sulphocarbol. (See Aseptol.)

Sulphuretted Hydrogen was introduced by M. Bergeon as a destroyer of the tubercular bacillus in cases of phthisis. He administered the gas by the bowel, and diluted it with carbon dioxide. This barbarous method of treatment appears to be now passing entirely out of use. Any benefit obtained from it was probably from the CO_2.

Suprarenal Gland has been introduced as a remedy for Addison's disease. It powerfully increases blood pressure by causing contraction of the small vessels. Velich found that a drop of an extract made from the gland caused anæmia of the

eye and skin vessels when applied locally. The dose of 5 to 15 grs. of dried gland in tabloid form has been reported as giving marked results in Addison's disease; the writer tried it carefully in two cases, and found it valueless, and in one case of diabetes insipidus with similar result. Those who report favourably of it state that it must be given for several weeks before any good results are to be expected. It cannot possibly have any curative action upon the organic lesion causing the disease, but in some cases it may counteract the low tension produced by the absence of the normal suprarenal secretion. Recently the active principle has been isolated in a crystalline form; another principle with antagonistic action has also been isolated.

Symphorol, or Caffeine Sulphonate, is introduced as a safe and reliable diuretic, which increases the amount of urine without raising the blood pressure; it stimulates the renal epithelial cells. There are three symphorols designated each by the letters N., L., S., indicating the symphorol of sodium, lithium, or strontium. 15 grs. of either salt can be given every 6 hours in capsules or wafers. The N. salt is the one generally prescribed.

Taka-Diastase is a yellowish-white powder, being a ferment produced by a fungus (Aspergillus Oryzæ) on heated rice. It is, according to Merck, known in Japan as Koji, and has been used in the production of alcohol from maize. It changes in a few minutes 100 times its weight of starch into maltose. 2 to 5 grs. may be given in wafer form in the dyspepsia caused by starchy foods, and in cases of hyper-acidity of the stomach. It is in this latter condition that the best results of the drug are observed, and it may be prescribed like papain with sodium bicarbonate.

Tannal. (See under Aluminium, page 494.)

Tannalbin is a brown tasteless powder, being an albuminate of tannin, prepared at a high temperature so as to be insoluble in the stomach, and therefore it does not interfere in any way with digestion, whilst it is afterwards split up in the intestines, and acts as an astringent. Vierordt prefers it to all other intestinal astringents. It may be given with meals in doses up to 30 grs., and to infants in 5 gr. doses in all forms of diarrhœa alone or with cod-liver oil.

Tannigen is a grey tasteless powder, being Diacetyl tannin. It is introduced as an intestinal astringent; being unacted upon by the stomach, it passes into the intestines, where it is split up and exerts its astringent action. Numerous observers testify to its value, and it may be given in wafer form, in doses of 15 to 20 grs. Tannalbin will probably be found to replace it, as it has failed in the diarrhœa of phthisis.

Tannoform is a pinkish, odourless, tasteless, insoluble powder, being Methylene-di-tannin, produced by the action of formaldehyde on tannin. It is claimed for it that it is absolutely unirritating to mucous or other surfaces. Internally, it is given like tannalbin and tannigen in wafers, in doses of 15 grs., as an intestinal astringent in diarrhœa, enteritis, &c. But it is for its local action that tannoform is most praised. It is stated by Mering and others to be the best of all local astringents in bromidrosis. When sprinkled on the skin it instantly stops all sweating, and destroys all odour. It is of great value as a local agent when applied to tender or so-called scalded feet, and is recommended for troops on the march. It is recommended as a substitute for iodoform in the treatment of ulcers, wounds, eczema, burns, leucorrhœa, either sprinkled alone or with starch or talc, or used as a 10 per cent. ointment.

Tannon is the name given to a brownish, tasteless, odourless, and insoluble powder produced by the action of tannin on hexamethylentetramin. It is given in diarrhœa and enteritis, and in all cases where tannin is indicated, in doses of 15 grs. three times a day. It has proved very valuable in tubercular ulceration and in typhoid diarrhœa with or without hæmorrhage.

Tanosal is the Tannate of Creosote in the form of a brown hygroscopic powder. A 5½ gr. pill will contain 3½ grs. creosote, and it is claimed for it that it is the least irritating of the creosote preparations, and should be preferred to them in tuberculosis. It may be given in solution in water.

Tellurium. (See Sodium Tellurate, page 595.)

Tenaline. (See under Arecoline.)

Terpin Hydrate occurs in colourless, prismatic crystals, obtained by acting upon a mixture of turpentine and alcohol with nitric acid. It is found to be a good expectorant, and has been used by Fereira, Lepine, and many others in bronchitis and asthma. It increases and liquefies the expectoration in doses of 3 grs. in pills. In larger doses it acts as a diuretic, and has been used with success in various bladder affections and in nephritis. It is stated that it reduces the number of the attacks in whooping-cough, and that it stops hæmoptysis.

Terpinol is an oily, aromatic, liquid, colourless body, prepared by treating the previous substance with acids. It is, like it, insoluble in water, and is used as an expectorant, given in capsules or pills, or per rectum, in doses of 10 to 20 minims. It should not be confounded with Terpincol, which is a thick, colourless alcohol contained in terpinol, and now used to mask the odour of iodoform.

Tetra-Ethylammonium Hydroxide exists in fine deliquescent crystals, which have a marked solvent power over uric acid. It has been recommended in acute rheumatism and gout, in doses of 5 to 10 minims of a 10 per cent. solution.

Tetronal, or Diethylsulphondiethylmethane, is a body existing in tabular, odourless, shining crystals, which is closely allied to sulphonal and trional. It has been administered in a large number of cases as an hypnotic, and its indications are the same as those for sulphonal, but in some very obstinate nervous conditions it has given better results, though it often failed in conditions like delirium tremens. In 220 cases its administration was not followed by any unpleasant after-consequences. Tetronal is cumulative like sulphonal, and upon the whole it has not succeeded in coming into the same general use. It is less reliable than trional; best given in 15 to 30 gr. doses in wafers.

Teucrin is a sterilised fluid extract of Teucrium scordium, introduced by Mosetig-Moorhof. It is supplied in glass tubes, each containing one dose (3 c.c.m.) which is to be injected into the tissues around cold abscesses, lupus, &c., with the view of producing a local stimulating effect, and exciting healthy action in the diseased parts.

Thalline, or Tetrahydroparamethyloxychinoline, is a synthetically prepared basic substance introduced by Skraup as an antipyretic and antiseptic. Owing to its power of destroying the red corpuscles it has almost ceased to be given internally. The sulphate and tartrate in 4 or 6 gr. doses cause marked fall in fever heat with much sweating and sometimes collapse. They were used by Goll in gonorrhœa; he gave the drug internally, and used a bougie containing $3\frac{1}{2}$ grs. of the sulphate thrice daily; or injections of a 2 per cent. solution were employed with marked success.

Thalline Periodide is a salt in dark crystalline masses which has been given in 3 gr. pills in cancer 6 or 8 times a day by Granville, who reports that the tumours disappear under this treatment. A little musk was added, and, when the skin was dry, a little pilocarpine.

Thanatol is a synonym of Guæthol (which see).

Theobromine is an alkaloid obtained from the seeds of Theobroma cacao in white, crystalline powder. It is maintained by G. Sée to be the best known diuretic, and preferable to diuretin, as it is harmless and may be used in every kind of cardiac dropsy in doses of 8 grs. in powder four times a day. Huchard maintains that it is the best tonic for the senile heart. (See also Diuretin, its double salt).

Thermodin (Acetyl-para-ethoxy-phenyl-urethane) exists in odourless insoluble crystals, introduced by Merck. Schmidt extols it as a safe and certain antipyretic in doses of 8 or 10 grs. in wafer. No ill effects have been reported from its use. Mering recommends it in influenza and phthisis.

Thilanin is a brownish semi-solid substance like vaseline, prepared by the action of sulphur upon lanoline. It contains 3 per cent. of sulphur, and it is introduced as a remedy for eczema and other skin diseases. It is claimed for it that it soothes inflammation and allays all itching.

Thioform. (See under Bismal.)

Thiol exists in dry scales, or as a strong solution of these. It is prepared from ordinary gas oil, and in its properties it closely resembles ichthyol, for which drug it has been recommended as a substitute in chronic scaly skin diseases, eczema, &c. It has been used by Gothchalk (1 part in 5 of glycerin) as an application to the ulcerated cervix uteri, and it has given good results in burns, erysipelas, &c., applied as an ointment of the same strength. It possesses the advantage over ichthyol in being odourless. It has been given internally in similar doses; thus 5 grs. of the *dry* thiol may be given three times a day in pill. 1 dr. of the *liquid* thiol to 1 oz. vaseline is the usual strength for ointments in eczema, &c. 1 part to 4 or 5 of talc may be used as a dusting powder.

Thio-Resorcin and Di-iodo-thio-Resorcin are amorphous substances, the former of a pale yellow, and the latter of a brown colour. They are compounds of resorcin with sulphur, insoluble in water, and have been introduced and used as substitutes for iodoform, which they closely resemble. It is claimed for them that they are innocuous and free from unpleasant odour. They may be applied as a powder or as an ointment (1 in 8) in all conditions in which iodoform is indicated.

Thiosinamin, or Allyl-sulpho-urea or Rhodallin, exists as yellowish crystals, obtained by heating mustard oil, alcohol, and ammonia. It is recommended by Hebra as an injection (15—20 per cent.) in lupus, and into the tissues surrounding uterine indurations and urethral strictures in 5 minim doses.

Thiuret is a crystalline powder, introduced as an iodoform substitute. It is a derivative of sulphaminol, and the phenol-sulphonate is the salt generally employed. When applied as a dusting powder to moist surfaces nascent sulphur is given off.

Thuja Occidentalis, or Arbor Vitæ, is an old American remedy, used as a powerful emmenagogue like savin, and as a local remedy for warts and condylomata. Baratoux has used a tincture (1 in 5) internally in doses of ½ to 1 dr., at the same time

applying a spray of 1 in 20, to growths and tumours about the nose, mouth, ear, pharynx, and larynx. He claims that this treatment rapidly destroyed all fetor and discharge, and ultimately reduced the vegetations and diminished the size of the new growths. Papillomata of the ear and nose were cured, and epitheliomas were considerably checked in their growth.

Thymacetin is a white, crystalline powder allied to phenacetin. It is introduced as an analgesic, antipyretic, and hypnotic, in doses of 10 to 20 grs., but its action is unsatisfactory and feeble.

Thymus Gland has been administered as a restorative in exophthalmic goitre. The writer has obtained good results with 5 gr. doses of the dried gland substance in tabloids *ter in die* in several cases, but sometimes it fails and may even exaggerate the symptoms.

Tolypyrine, or Tolyl-antipyrine, is a new analgesic closely allied to antipyrine, for which it is introduced as a substitute, and from which it only differs in containing a third methyl group in the para position of the phenyl group (Helbing). It possesses no advantage over antipyrine except cheapness. In similar doses it has the same action and effects. If it should come into general use like antipyrine, doubtless its drawbacks will become better known.

Tolysal is the salicylate of the preceding substance, being Para-tolyl-dimethyl-pyrazolone salicylate. In its action it resembles a combination of salicylic acid and antipyrine, and it is consequently recommended as an analgesic and antipyretic, chiefly in acute rheumatism and rheumatic neuralgia, in doses of 10 to 20 grs. four times a day.

Tonga is a preparation consisting of chopped stalks and small quantities of the leaves and inner bark of some plants imported from Fiji; believed to be derived from *Rhaphidophora vitiensis* or *Epipremnum mirabile*, and *Premna taitensis*. From these a liquid is prepared whose properties have been found to be decidedly antineuralgic. Ringer and Murrell investigated the drug, and found it to speedily cure 6 out of 8 cases of neuralgia in which they tried it.

Dose—Of the liquid tonga, 1 dr. three times a day.

Traumaticin is a thick fluid, being a solution of 1 part of gutta-percha in 9 of chloroform, and corresponding with the solution removed from the B.P. It is used as a basis for the application of chrysarobin, ichthyol, &c., in skin diseases.

Traumatol is Iodocresol—an insoluble, odourless, stable, and powerful antiseptic, containing 54 per cent. iodine. It is introduced as one of the thousand and one substitutes for iodoform.

It is claimed for it that it is non-irritating, and has local anæsthetic properties. It can be used in every condition in which iodoform is indicated, as a powder or 10 per cent. ointment.

Tribromphenol. (See Bromol.)

Trichlorphenol. (See Acid. Trichlorphenic.)

Trikresol is an oily, colourless liquid, consisting of the three cresols freed from all impurities. It dissolves in 40 times its bulk of cold water, and forms a solution three times as strong as ordinary carbolic lotion. A 1 per cent. solution is used for instruments and for disinfecting the hands. It is claimed for it that it has little toxic action, and does not affect metals or cause numbness or slipperiness of the fingers during operations.

Trimethylamine, or Secalin, is a compound ammonia, obtained by distilling herring brine (or decomposing fish) with lime. It has been used successfully in the treatment of acute rheumatism, in which disease it has been found to relieve pain, reduce temperature, and diminish the frequency of the pulse.

Its external use as a liniment (1 to 3 of glycerin), applied to the painful joints of chronic rheumatism, has given such relief as to warrant its introduction as an anodyne.

Large doses increase the frequency of the pulse, whilst small doses exert a sedative action upon the heart, and act as a stimulating expectorant.

Dose of the hydrochlorate—2 grs. every 2 hours, or 20 minims of the distilled solution (20 per cent.) in peppermint water and sugar, which disguise its fishy taste and smell. This 20 per cent. solution was formerly called in error Propylamine.

Trional is a substance existing in shining crystals, with a bitter taste and slightly soluble in water. It may be regarded as sulphonal with a methyl displaced by an ethyl group. It acts like sulphonal, only more rapidly, is less cumulative, and is said to be less frequently followed by drawbacks. It should be given in cachets in doses of about 30 grains. It is, perhaps, the safest of all the newer hypnotics, and has been found most reliable in mania and simple insomnia where pain is not present. The only drawback which the writer has noticed is its liability in some cases to upset the digestion when administered in fevers.

Trioxymethylene is Triformal, or Paraformic Aldehyde (which latter see).

Triphenin is Propionylphenetidin, and is thus allied to phenacetin. It exists in crystalline flakes, which are almost insoluble in water. Mering introduces it as an analgesic and antipyretic like phenacetin, in doses of 8 to 16 grs. in wafers or powders. As yet no untoward symptoms have been reported.

Triticum Repens, or Couch Grass—This common grass has been most successfully used in chronic bladder ailments. It is a feeble diuretic, and appears to possess the virtues claimed for the stigmata of maize. It has fallen into disuse, because the dried grass appears to be almost inert. It is the *fresh rhizome* which should be always used, 2 ozs. boiled in 1 pint water for half an hour, of which a wine-glassful should be taken every 4 or 6 hours.

Tropacocaine. (See under Cocaine Salts, page 521.)

Trypsin. (See page 427.)

Tuberculin, or Koch's Lymph, which is a sterilized glycerin extract of pure cultivations of the bacilli causing tuberculosis, is still occasionally used as an agent in the treatment of phthisis and lupus. At present there appears to be a very strong objection to the use of this substance by the great majority of its former advocates. There are, however, a few who still advocate its use in lupus. The initial dose is ·001 c.c. It is also a valuable diagnostic agent, as tubercular disease may be accepted in all doubtful cases where marked fever or reaction follows its injection, and it is used for diagnosing tubercle in cattle. Tuberculocidin, or Alexin, is the name given by Klebs to a purified solution of tuberculin, which is given in doses of twice those of tuberculin. Koch now states that his old tuberculin did not affect the bacilli, but simply immunised against the toxins. He claims to have discovered a derivative which cures early cases, but this new tuberculin (T.R.) has been condemned by several very reliable authorities. It is prepared by mechanical trituration of highly virulent cultures, and afterwards by centrifugal separation from aqueous mixtures. The activity and strength of this new preparation can be judged by the initial dose of the solid substance, viz., $\frac{1}{32000}$ grain. This is gradually increased till $\frac{1}{3}$ gr. is reached.

Tumenol exists in two forms—the liquid tumenol and tumenol oil, which contains tumenol sulphones as well as tumenol sulphonic acid, and the tumenol powder which consists of the acid only. These substances are extracted from mineral oils by strong sulphuric acid, after removal of their phenols and pyrrols by treatment with alkalies. Neisser, who has used these agents in eczema, pruritus, &c., thinks that they act in an entirely different way from ichthyol; he regards them as reducing agents, the sulphur contained in them only playing a subordinate part. The thick, dark oily liquid mixes well with zinc gelatin. It is used as a substitute for ichthyol in 20 per cent. ointment or tincture, or it may be painted on diseased surfaces without dilution.

Tussol (Antipyrine Amygdalate or Madelate) exists in granular crystals. It is introduced as a remedy for whooping-

cough by Rehn, who states that it rapidly diminishes the paroxysms. It may be given in doses of 1 gr. to a 1 year old infant.

Ulexine is a colourless, or yellowish-white, crystalline alkaloid, obtained from the common gorse or furze or whin (Ulex europæus). It is found, in large doses, to be a powerful respiratory poison and paralyser of the motor nerves. It has a decided diuretic action, and has been given in cases of dropsy depending on heart disease, and it is maintained to be much more reliable than Sparteine. At present it is not advisable to give more than $\frac{1}{12}$ gr. The hydrobromate, which is freely soluble in water, is the salt to be recommended. It has also been advocated as an antidote to strychnine.

Ural, or Uralium, or Chloral-urethane, as its name implies, is a compound of chloral with urethane, existing in the form of colourless, bitter crystals. It is introduced by Bischof and Poppi as an hypnotic, and it is claimed for it to be rapid in its action, and free from unpleasant effects, as the urethane is said to counteract the depressing action of the chloral, but upon the other hand it has been found to reduce the blood pressure and produce serious drawbacks. It has been given in doses of 20 to 50 or even 60 grs. in syrup, flavoured with an essential oil to disguise its bitter taste.

Uranium—The nitrate has been recently re-introduced as a remedy for diabetes. It lessens thirst and diminishes the amount of sugar in the urine, and consequently lessens the bulk of the urine passed; at the same time the checking of the glycosuria allows the patient to gain weight and recover strength. The ordinary dose is about 3 grs. *ter die*. Large doses cause sugar and albumen to appear in the urine of healthy persons.

Urari. (See Curara, page 525.)

Urea, in a pure crystallised form, has been recently re-introduced as a diuretic. It has been proven by the researches of Klemperer and Mering that it has the power of dissolving uric acid and enormously increasing the amount of urine. It has been strongly recommended as a preventive and as a cure for uric calculi, and as a means of obviating tapping in cirrhosis of the liver. The daily dose at first is 2 drs., increased to 4 drs., and later on to 5 drs. For the solution of calculi, half a tea-spoonful four times daily of a mixture of urea, bicarbonate of soda, and carbonate of lime is recommended.

Urethane (Ethyl-urethane or Ethyl-carbamate) is a substance in soluble, white, inodorous crystals, prepared by the action of nitrate of urea on ethyl alcohol. It is a mild hypnotic, not followed by any objectionable after consequences. Refreshing sleep

may be induced by about 20 grs. given at bed-time, and repeated in two hours if necessary. This apparently harmless hypnotic has not fulfilled the expectations raised by the first glowing reports of its virtues. The writer has been invariably disappointed in every instance in which he has used it, though often the dose was 20 grs. It has, however, been recently given in doses of 45 to 60 grs., but it will probably soon cease to be employed as an hypnotic except in the case of children. It is reported as having been used in tetanus with success, and in strychnine poisoning.

For Phenyl-urethane, see Euphorin; for Ethyl-chloral-urethane, see Somnal; and for Chloral-urethane, see Ural.

Uricedin. (See under Lithium Salts.)

Uropherin. (See under Lithium Salts.)

Urotrophine. (See page 536, under Formin.)

Ustilago Maidis, or Corn Smut, or Corn Ergot is the fungus which attacks maize, causing irregular swellings on the young ears, from the size of a pea to that of a fœtal head. The blackish, dusty powder in the interior is the part employed. It appears to act like ergot, and it keeps better, and is less expensive, and is coming into favour in America and Canada. Brunton thinks it contains probably the same alkaloids as ergot. It appears, however, to differ from ergot in not producing prolonged contraction of the uterus, but in increasing markedly the rhythmic contractions and relaxations, hence it is more valuable during labour than after (Hubbard).

Dose—1 dr. of the liquid extract (1 in 1).

Vanillin exists in acicular crystals, and is the odorous and flavouring principle of vanilla pods. It is prepared from coniferin artificially, and from eugenol and from nitro-benzol. It is antiseptic, and has been recommended in 1 grain doses in various forms of dyspepsia. Its chief use, however, is as a flavouring agent.

Veratrol, or Pyrocatechine-dimethyl-ether, is a colourless liquid antiseptic, local anæsthetic, and analgesic. It is painted on the skin over neuralgic nerves, or with the view of reducing the body temperature like guaiacol, or in 2 minim capsules four times a day in phthisis and tubercular diseases. It is also produced in the crystalline form.

Verbascum Thapsus (The Mullein Plant)—Quinlan has drawn attention to the usefulness of this plant as a potent remedy for increasing the weight in pulmonary and other wasting diseases. In Ireland its virtues have been long appreciated in pulmonary complaints by the poorer classes, and the original method of administration, which is that recommended by Quinlan, s to boil 4 ozs. of the fresh leaves, or a corresponding quantity of

the dry, for 10 minutes in a pint of milk fresh from the cow, to be drunk whilst still warm. This dose should be taken when possible three times a day.

It appears to act like cod-liver oil, and it also possesses expectorant properties. The virtue of three pints daily of good milk must very substantially augment the therapeutic action of the mullein plant. The same authority has, however, experimented with this remedy, with and without milk, and is satisfied of its power over the nutrition of the body when given alone, as in the form of succus.

The taste of the plant is objectionable, but milk considerably masks it. The succus can be taken in porter. The young plants resemble those of digitalis in appearance.

Relief to bronchial asthma and to the hacking cough of phthisis has been obtained by smoking the leaves.

Viburnum Opulus (The Snow-Ball Tree)—The dried leaves of this tree were found by Jacubovsky to relieve angina pectoris, and Manguby has tried the dry berries with very decided success. He prepares an infusion of two table-spoonfuls of the berries in water, which he causes to be administered in divided doses during the 24 hours. A fluid extract of the bark (under the name of Cramp Bark) is extensively used as an antispasmodic in colic, hysteria, &c., and has been used in America with considerable benefit in dysmenorrhœa, and as a uterine sedative in menorrhagia and threatened abortion. It appears to closely resemble in its action the following :—

Viburnum Prunifolium, or Black Haw—The bark of this tree is in great repute in America ; it possesses properties closely allied to the previous remedy. The liquid extract in 1 drachm doses is given in dysmenorrhœa, and as a uterine sedative to prevent contraction of the uterus in the early months of pregnancy, and to check uterine hæmorrhages and the vomiting of pregnancy.

Schatz affirms that in viburnum we have a remedy possessed of virtues owned by no other drug, as it suppresses or reduces the uterine contractions liable to occur in women who have aborted. He insists upon 45 to 60 grs. of the solid extract being given for months.

Viscum Album. (The Mistletoe, see page 565.)

Warburg's Tincture (Tinctura Pyrexialis)—A preparation which has gained for itself a very high reputation in the treatment of pyrexia ; it is prepared from a formula published in the *Lancet* of Nov. 13th, 1875. It is undoubtedly of value in malaria and other fevers, and in malarial neuralgia. It is administered in a table-spoonful dose, after the bowels have been thoroughly emptied ; no drink being permitted ; it is

repeated again in 3 hours, after which profuse aromatic perspiration and a marked fall of temperature set in, with rapid convalescence. It is very useful in several forms of collapse.

Its power does not appear to lie in its quinine, camphor, aloes, rhubarb, or opium, but in some of the *aromatic* plants, and in the agaric contained in it.

Xeroform. (See under Bismuth Salts.)

Zea Mays (or Corn Silk)—The stigmata or green pistils of *Zea Mays* have been much praised in America as possessing specific or alterative action upon the bladder and genito-urinary tract. It appears to be most active when prepared fresh, and good results have followed its use in cystitis. It is a diuretic of the mildest and least irritating type. In the nocturnal incontinence of urine it has been tried with benefit, and it has been given with success in the later stages of gonorrhœa.

Dr. St. George has obtained excellent results with the liquid extract of maize stigmata in cases of catarrh of the bladder, and in one case where the ureter was inflamed, this remedy "relieved pain and suppressed discharge as if by magic." He has also found it to diminish the anasarca and to increase the urine in cardiac dropsy.

Many observers have reported favourably of this drug in cases of renal calculi, catarrh of the bladder and pelvis of the kidney.

Dupont has examined its pharmacology, and found that it possesses properties which place it amongst the first of remedies as a diuretic and cardiac tonic, like digitalis. He found that the extract was well tolerated, that it increased the urine from 20 to 80 ozs. sometimes. He believes it to be specially indicated in heart diseases with much dropsy. It acted more speedily than digitalis; it reduced the pulse rate and increased the heart's strength. 1 dr. of the liquid extract (1 in 1) may be given three times a day. 20 grs. of the extract were given three or four times daily.

Zinc Salts—In addition to those in the B.P. there are several salts of zinc in constant use as:—

The Bromide which is a soluble granular powder used in solution in 5 to 8 gr. doses in epilepsy.

The Borate—A white amorphous powder used by Kollo as a substitute for iodoform.

The Citrate and the Lactate are both used in epilepsy in doses of about 12 or 15 grs.

The Phosphide possesses the properties of free phosphorus, and is given in the pill form in doses of $\frac{1}{20}$ to $\frac{1}{5}$ gr.

The Cyanide is recommended in heart disease, and cardiac tonic and sedative properties are assigned to it in doses of $\frac{1}{4}$ gr.

The Sulphhydrate, an unstable white precipitate, is used as a 1 in 10 ointment in eczema, tinea, &c., and given internally in 1 gr. doses.

The Permanganate is employed as a substitute for the potassium salt in gonorrhœa (1 gr. in 6 ozs.)

The Sozoiodol (page 596), the Chrysophanate, Gynocardate, Stearate, Ichthyolate, and Oleate are indicated in the conditions in which their acids are employed.

The Subgallate is a greenish powder used as a dusting powder or ointment, and it is also given internally in 2 gr. doses as an astringent and antiseptic in diarrhœa.

B.P.C. FORMULÆ.

1894.

The British Pharmaceutical Conference, in 1886, appointed a Committee to prepare a Formulary of Unofficial Remedies. The following is a brief summary of their results, some of which are incorporated in the present issue of the B.P. Physicians are requested in ordering any of the formulæ to add the letters B.P.C. (British Pharmaceutical Conference).

Acidum Hydrocyanicum (Scheele). 4 per cent.

This is Prussic acid of double the B.P. strength, since it contains 4 per cent. of HCN. It is prepared by the B.P. process. Dose—1 to 4 minims.

Acidum Hypophosphorosum. 30 per cent.

Prepared by adding H_2SO_4 to a hot solution of hypophosphite of barium, filtering, and evaporating the filtrate till the S.G. 1·1367 is reached. Dose—2 to 5 minims.

Chloral Cum Camphora. 1 in 2.

Prepared by rubbing 1 oz. camphor and 1 oz. hydrate o chloral in a warm mortar till liquefied.

Chloroformum Aconiti. 1 in $1\frac{1}{2}$.

Aconite root 20 ozs., after maceration with $1\frac{1}{2}$ ozs. stronger solution of ammonia and 20 ozs. distilled water, is dried and powdered, and finally percolated with 30 ozs. chloroform.

Chloroformum Belladonnæ. 1 in $1\frac{1}{2}$.

Prepared as chloroform of aconite by substituting belladonna root for aconite.

Chloroformum Camphoratum. 2 to 1.

2 ozs. camphor dissolved in 1 oz. chloroform.

Collodium Belladonnæ. 1 in 10.

(Synonym—Emp. Belladonnæ Fluidum.)

Prepared by dissolving 960 grs. alcoholic extract of belladonna leaf in 9 ozs. rectified spirit, adding 9 ozs. pure ether, decanting after 12 hours, and dissolving in the mixture 130 grs. camphor and $\frac{1}{2}$ oz. pyroxylin, and finally making up to 1 pint with equal volumes of rectified spirit and pure ether.

Collodium Stypticum.

Prepared by dissolving 1 oz. tannic acid in a filtered solution of 44 grs. benzoin in 1 oz. absolute alcohol, adding 4 ozs. pure ether and 44 grs. pyroxylin, and decanting after 3 days.

Elixir Cascara Sagrada

Has now been made official under the name Syrupus Cascaræ Aromaticus. (See page 218.)

Elixir Glusidi. 3 grs. in 1 dr. (Synonym—Elixir Saccharini.)

Gluside 480 grs., bicarbonate of sodium 240 grs., and distilled water 10 ozs., dissolve, and add rectified spirit 2½ ozs., filter, and wash the filter with q.s. water to measure 20 ozs. Dose—5 to 20 minims.

Elixir Guaranæ. 1 in 5.

Guarana in No. 60 powder, 4 ozs., mixed with light magnesia ½ oz. and proof spirit 3 ozs., is macerated for 24 hours, mixed with 8 ozs. sand and percolated with proof spirit till 16 ozs. are obtained and the residue pressed. To the percolate add oil of cinnamon 6 minims and 2 ozs. syrup, and make up to 20 ozs. by addition of the expressed liquid. Dose—½ to 2 drs.

Elixir Phosphori. $\frac{1}{50}$ gr. in 1 dr.

Compound tincture of phosphorus 4 ozs. mixed with glycerin 16 ozs. Dose —15 to 60 minims.

Elixir Rhei. 1 in 4.

5 ozs. rhubarb and 2 ozs. fennel are repeatedly exhausted with spirit and water (1 in 3) q.s., to the resulting tincture 3 ozs. glycerin and 4 ozs. sugar are added, and the whole made to measure 20 ozs. Dose—1 to 3 drs.

Elixir Sennæ. 1 in 1½.

Prepared by repeated exhaustion of 16 ozs. senna by rectified spirit and water, till 16 ozs. of product be obtained; this is heated with 12 ozs. sugar, and when cold, 24 minims chloroform and 2½ minims oil of coriander, ½ dr. tincture of capsicum, and 3 drs. rectified spirit, are added, and the product made to measure 24 ozs. Dose—1 to 3 drs.

Elixir Simplex.

Oil of bitter orange 30 minims, dissolved in rectified spirit 6 ozs., and added to distilled cinnamon water 7 ozs. and syrup 7 ozs., and filtered till bright through paper well sprinkled with kaolin. Dose—20 to 60 minims.

Emulsio Olei Morrhuæ. 1 in 2.

Cod-liver oil 8 ozs., yolks of 2 eggs, powdered tragacanth 16 grs., elixir of saccharin 1 dr., simple tincture of benzoin 1 dr., spirit of chloroform 4 drs., essential oil of bitter almonds 8 minims, distilled water to 16 ozs. Triturate the tragacanth with a little of the oil, add the yolks and stir, gradually adding water and oil alternately; transfer to a pint bottle, adding the remaining ingredients previously mixed together, shake well and make up to 16 ozs. Dose—2 to 8 drachms

Extractum Belladonnæ Folii Alcoholicum.

Prepared by exhausting belladonna leaves by maceration and percolation with rectified spirit, and evaporating over a water-bath to the consistence of an extract.

Extractum Grindeliæ Liquidum. 1 in 1.

Prepared by exhausting 20 ozs. grindelia, in No. 20 powder, with spirit, reserving the first 17 ozs. and distilling the spirit from the remainder, dissolving the resulting extract in the first liquid, and making up with spirit to 20 ozs. Dose—10 to 30 minims.

Extractum Hæmatoxyli Liquidum. 1 in 1.

Prepared by exhausting 20 ozs. unfermented logwood by repeated boilings in water, and evaporating the resulting decoction to 20 ozs., and decanting after 7 days. Dose—½ to 2 drachms.

Extractum Tritici Liquidum. 1 in 2.

Prepared by exhausting 10 ozs. triticum rhizome in No. 20 powder (gathered in spring, and rootlets rejected), with boiling water, in a percolator, evaporating the liquid to 15 ozs., adding 5 ozs. spirit, and, after 48 hours, filtering, and making up to 20 ozs. with spirit and water (1 to 3). Dose—1 to 6 drachms.

Glycerinum Belladonnæ. 1 in 2.

1 oz. extract of belladonna rubbed in a warm mortar with 1 dr. boiling water, and glycerin added to make the product measure 2 fluid ozs.

Injectio Curare Hypodermica. 1 in 12.

Curare 5 grs. made into a paste with water and thrown into a funnel plugged with absorbent wool, and water poured upon it till 1 dr. is obtained. Dose—1 to 6 minims.

Linimentum Opii Ammoniatum. 9·9 grs. per oz.

Prepared by mixing and filtering after standing 7 days, tincture of opium 6 ozs., liniment of soap 6 ozs., liniment of belladonna 1 oz., compound camphor liniment 6 ozs., and strong solution of ammonia 1 oz.

Liquor Bromo-Chloral Compositus. 10 grs. each in 1 dr.

Prepared by adding a solution of 1,600 grs. potassium bromide in 7 ozs. water to a solution of 1,600 grs. chloral hydrate, 400 minims tincture of Indian hemp, 400 minims tincture of fresh orange peel, 1,600 minims juice of henbane, $3\frac{3}{4}$ ozs. syrup, and ½ oz. liquid extract of liquorice, filtering and washing the filter with water to produce 1 pint. Dose—½ to 2 drs.

Liquor Ferri Hypophosphitis Fortis. 5 grs. in 1 dr.

Prepared by mixing solutions of sulphate of iron (760 grs. in 5 ozs.) and hypophosphite of barium (830 grs. in 15 ozs.), shaking and adding 100 minims of diluted sulphuric acid, and syphoning off the clear liquid. Dose—10 to 30 minims.

Liquor Hypophosphitum Compositus.

(Synonym—Liq. Ferri Hypophosph. Co.)

Prepared by dissolving in 12 ozs. water, hypophosphites of calcium 320 grs., of sodium 320 grs., and of magnesium 160 grs., and adding 6 ozs. of last preparation and ½ oz. hypophosphorous acid (30 per cent.)

1 dr. contains 2 grs. each of hypophosphites of sodium and calcium, and 1 gr. of magnesium and 1½ grs. of iron. Dose—½ to 2 drs.

Liquor Picis Carbonis. 1 to 5.

This is now Official. (See page 266.)

Pix Carbonis Liquida Præparata.

Now Official as Pix Carbonis Præparata. (See page 266.)

Syrupus Acidi Hydriodici. 1 per cent.

Prepared by mixing a solution of 152 grs. potassium iodide and 12 grs. potassium hypophosphite in 200 minims water, with one of 140 grs. tartaric acid in 5 drs. proof spirit, filtering, washing with proof spirit and evaporating the filtrate till it weighs 600 grs., and mixing it with syrup q.s. to produce 1 pint. Dose—20 to 60 minims.

Syrupus Apomorphinæ Hydrochloratis. 1 dr. contains $\frac{1}{32}$ gr.

Dissolve 5 grs. hydrochlorate of apomorphine in 7 drs. water, 7 drs. spirit, and 15 minims diluted hydrochloric acid, and add syrup q.s. to 1 pint. Dose—½ to 1 dr.

Syrupus Butyl-Chloral. 1 dr. contains 2 grs.

320 grs. hydrate of butyl-chloral dissolved in q.s. syrup (hot) to make 20 ozs. Dose—1 to 4 drs.

Syrupus Calcii Hypophosphitis. 1 gr. in 1 dr.

Prepared by dissolving 160 grs. hypophosphite of calcium in 9 ozs. distilled water, filtering and adding 16 ozs. sugar, and, after cooling, adding 20 minims hypophosphorous acid and distilled water to 20 ozs. Dose—1 to 4 drs.

Syrupus Cascara Sagrada. 1 in 5.

Prepared by mixing 4 ozs. liquid extract of cascara sagrada, 3 ozs. liquid extract of liquorice, 2 drs. carminative tincture and syrup q.s. to make 20 ozs. Dose—1 to 4 drs.

Syrupus Codeinæ. 1 gr. in 1 oz.

Prepared by dissolving 20 grs. codeine in $1\frac{1}{4}$ ozs. proof spirit and $1\frac{1}{4}$ ozs. water, and syrup q.s. to make 20 ozs. Dose—½ to 2 drs.

Syrupus Ferri Bromidi. $4\frac{1}{2}$ grs. in 1 dr.

Prepared by shaking ½ oz. iron wire, free from oxide, with 533 grs. bromine and 4 ozs. water, and filtering the liquid into a hot syrup composed of sugar 14 ozs., and water 6 ozs. Dose—½ to 1 dr.

Syrupus Ferri Hypophosphitis. 1 gr. in each dr.

Prepared by mixing 4 ozs. strong solution of hypophosphite of iron with 16 ozs. syrup. Dose—½ to 2 drs.

Syrupus Ferri Phosphatis Compositus.

Prepared by dissolving $37\frac{1}{2}$ grs. iron wire, free from oxide, in 1 oz. concentrated phosphoric acid and 5 drs. water, and, when cold, adding to a solution of 120 grs. precipitated carbonate of calcium in 4 drs. concentrated phosphoric acid, and 2 ozs. water; after mixing, add 9 grs. bicarbonate of potassium and 9 grs. phosphate of sodium, filter and add a filtered decoction of 30 grs. cochineal in 7 ozs. water in which 14 ozs. sugar have been dissolved and add q.s. water to 20 ozs. Each dr. contains ½ gr. phosphate of iron and 4-5th gr. phosphate of calcium. Dose—½ to 2 drs.

Syrupus Ferri et Quininæ Hydrobromatum.

(Synonym—Syr. Ferri Bromidi c. Quinina.)

Prepared by dissolving 160 grs. acid hydrobromate of quinine in 1 oz. water and 3 drs. diluted hydrobromic acid, and adding syrup of bromide of iron to 20 ozs. Each dr. contains 1 gr. acid hydrobromate of quinine and 4 grs. bromide of iron. Dose—½ to 1 dr.

Syrupus Ferri Quininæ et Strychninæ Hydrobromatum.

(Synonym—Syr. Ferri Bromidi c. Quinina et Strychnina.)

Prepared by dissolving $2\frac{1}{2}$ grs. strychnine and 160 grs acid hydrobromate of quinine in 1 oz. water and 3 drs. diluted hydrobromic acid, and adding syrup of bromide of iron to 20 ozs. Each dr. contains 1-64th grain strychnine, 1 gr. acid hydrobromate of quinine, and 4 grs. bromide of iron. Dose—½ to 1 dr.

Syrupus Ferri, Quininæ et Strychninæ Phosphatum.

Prepared by dissolving 75 grs. iron wire, free from oxide, in 10 drs. concentrated phosphoric acid and water, dissolving in the solution 5 grs. strychnine and 120 grs. phosphate of quinine, filtering into 14 ozs. syrup, and making up to 1 pint with water. Each dr. contains 1 gr. phosphate of iron, $\frac{3}{4}$ gr. phosphate of quinine, and 1-32 gr. strychnine. Dose—$\frac{1}{2}$ to 1 dr.

Syrupus Hypophosphitum Compositus.

Prepared by dissolving 20 grs. quinine (alkaloid) and 1 gr. strychnine in 2 drs. of 30 per cent. hypophosphorous acid and 3 ozs. strong solution of hypophosphite of iron, in this dissolving 80 grs. hypophosphite of calcium and 40 grs. each hypophosphites of manganese and potassium, and making up with syrup to 20 ozs. Each dr. contains 1-160th grain strychnine and $\frac{1}{8}$ grain quinine. Dose—$\frac{1}{2}$ to 2 drs.

Syrupus Ipecacuanhæ Aceticus. 1 in 42.

Prepared by dissolving $2\frac{1}{4}$ lbs. sugar in 20 ozs. vinegar of ipecacuanha. Dose—$\frac{1}{4}$ to 2 drs.

Syrupus Pruni Virginianæ.

Now Official. (See page 272).

Syrupus Sodii Hypophosphitis. 1 gr. in 1 dr.

Prepared by dissolving 160 grs. hypophosphite of sodium in 3 drs. water, filtering, and washing the filter with 1 dr. water, and adding q.s. syrup to measure 20 ozs. Dose—1 to 4 drs.

Tinctura Benzoini Simplex. 1 in 10.

Prepared by macerating 2 ozs. benzoin in 20 ozs. rectified spirit, and filtering.

Tinctura Bryoniæ. 1 in 10.

Prepared from *fresh* bryony root by calculating the moisture contained in it, and producing a proof spirit tincture by maceration for seven days of such a strength as that 10 ozs. shall represent 1 oz. of *dried* root. Dose—1 to 10 minims.

Tinctura Calendulæ Florum. 1 in 5.

Prepared by macerating and percolating 4 ozs. dried marigold flowers with 20 ozs. proof spirit. Dose—5 to 20 minims.

Tinctura Capsici Fortior. 1 in 3.

Prepared by macerating and percolating 10 ozs. capsicum fruit in No. 40 powder with 30 ozs. spirit. Dose—1 to 3 minims.

Tinctura Carminativa.

Prepared by macerating 600 grs. bruised cardamom seeds in 15 ozs. spirit for 7 days, and adding to the resulting tincture $1\frac{1}{4}$ ozs. stronger tincture of ginger and 100 minims each of oils of cinnamon, caraway, and clove, and making up with spirit to 20 ozs. Dose—2 to 10 minims.

Tinctura Convallariæ. 1 in 8.

Prepared by macerating and percolating $2\frac{1}{2}$ ozs. lily of the valley flowers and stalks dried, in No. 20 powder, with 20 ozs. proof spirit. Dose—5 to 20 minims.

Tinctura Coto. 1 in 10.

Prepared by macerating 2 ozs. bruised coto bark in 20 ozs. rectified spirit for 7 days. Dose—10 to 30 minims.

Tinctura Ergotæ Ammoniata. 1 in 2.

Prepared by macerating and percolating 10 ozs. ergot in No. 20 powder with 20 ozs. aromatic spirit of ammonia. Dose—10 to 60 minims.

Tinctura Erythrophlœi. 1 in 10.

Prepared by macerating and percolating 2 ozs. casca bark in No. 20 powder with 20 ozs. rectified spirit. Dose—5 to 10 minims.

Tinctura Eucalypti. 1 in 5.

Prepared by macerating and percolating 4 ozs. eucalyptus leaves in No. 20 powder with 20 ozs. rectified spirit. Dose—15 minims to 2 drachms.

Tinctura Euonymi. 1 in 5.

Prepared by macerating and percolating 4 ozs. euonymus bark in No. 20 powder with 20 ozs. rectified spirit. Dose—10 to 40 minims.

Tinctura Euphorbiæ Piluliferæ. 1 in 5.

Prepared by macerating and percolating 4 ozs. euphorbia in No. 20 powder with 20 ozs. proof spirit. Dose—10 to 30 minims.

Tinctura Iodi Decolorata. 12½ grs. to 1 oz.

Prepared by dissolving 250 grs. iodine, in 5½ ozs. rectified spirit, and adding 10 drs. strong solution of ammonia. After decolorisation, dilute with rectified spirit q.s. to measure 20 ozs.

☞ Before dilution the preparation may be prescribed as Tinctura Iodi Decolorata Fortior.

Tinctura Phosphori Composita. $\frac{1}{10}$ gr. in 1 dr.

Prepared by dissolving 12 grs. phosphorus in 2½ ozs. chloroform and adding 12½ ozs. ethylic alcohol. Dose—3 to 12 minims.

Tinctura Pruni Virginianæ.

This is now Official. (See page 272.)

Unguentum Hydrargyri Oleati. 1 in 2.

Prepared by mixing, without heat, equal weights of simple ointment and oleate of mercury.

Unguentum Oleo-Resinæ Capsici. 1 in 5½.

Prepared by adding 1 oz. oleo-resin of capsicum, to a melted mixture of ½ oz. yellow wax and 4 ozs. benzoated lard. As a mild counter-irritant, this ointment will bear dilution from 3 to 6 times.

Vinum Aurantii Detannatum.

Prepared by macerating ½ oz. gelatin (cut small) with 1 gallon orange wine for 14 days, and decanting.

Vinum Xericum Detannatum.

Prepared by macerating ½ oz. gelatin (cut small) in 1 gallon sherry for 14 days, and decanting.

INDEX

OF

POISONS AND THEIR ANTIDOTES.

(From the Author's "Dictionary of Treatment," page 735.)

POISONING.—In the treatment of poisoning, the first consideration in the great majority of cases will be to evacuate the contents of the stomach when this is possible. This may be accomplished by emetics or by the stomach-pump, or by tickling the fauces when these agents are not at hand. In poisoning by the strong mineral acids and all corrosive substances the stomach-pump is contra-indicated, but in the case of corrosive substances like carbolic acid it may be used cautiously if a soft tube be employed. Indeed, the soft India-rubber tube of the stomach-pump can scarcely do any harm except in the instances of most destructive poisoning by concentrated sulphuric or nitric acid, and the pump should always be fitted with such a tube in at least two sizes. When at hand, the pump should be preferred to every other means of emptying the stomach, and except in the limited number of cases just mentioned, it may be used even when there is room for considerable doubt in the diagnosis of poisoning in patients found in insensible or comatose conditions. The coroner's court will justly censure the practitioner who has been in attendance upon a patient picked up in an insensible condition if the evidence afterwards produced proves that a narcotic poison had been swallowed, though when seen by the physician no such evidence had been forthcoming, and the symptoms pointed to head injury, uræmia, or apoplexy. The cautious use of the pump with the rubber tube, when scientifically carried out, can in no way injure the patient's chances of recovery should the case ultimately turn out not to be one of poisoning; and as every minute's delay may be serious for the patient, and as there is thus short time for counsel and debate, he should be prepared to act accordingly and make his error upon the safe side.

The first time of using the stomach-pump is sure to be a bungling affair if the operator feels timorous or nervous. The tongue being depressed by the left index finger as the patient is seated in a chair, with the head well steadied by an assistant, and the gag in position, the tube is to be pushed steadily, boldly, and rapidly through the mouth, pharynx, and œsophagus till the stomach is reached. Though it is more difficult to pass the soft rubber tube, the confidence in its perfect harmlessness will be of great importance to the novice. He should not be deterred by the sound which may be produced by air passing through the tube as its extremity glides past the epiglottis, this ceases as the rubber is passed home into the stomach. During the pumping, by reversing the action of the levers, a little water may from time to time be sent into the stomach to clear the tube of any solid obstruction, and before withdrawing it finally, tepid water should be injected into the organ, and this should be pumped out again, the operation being continued till the washings return clear. The antidote may be mixed with the water, and in many instances a quantity

of this should be left in the stomach. In pumping opium or alcohol cases, after the washings return clear and free from odour, the stomach may be partially filled with strong infusion of tea or coffee.

The syphon tube may take the place of the stomach-pump in most cases.

30 grains of sulphate of zinc or 10 grains of sulphate of copper in a tumblerful of tepid water will prove efficient emetics; and apomorphine, 1-10th grain injected hypodermically acts with great certainty and rapidity when the patient is unable to swallow. Notice should be taken of the fact that though patients may often take apomorphine in doses of $\frac{1}{4}$ to $\frac{1}{8}$ grain by the mouth without experiencing nausea, this dose might prove fatal if given by the hypodermic method, owing to its rapid depressant effect upon the heart.

Mustard in dessert-spoonful doses, in copious quantities of tepid water, may be used when the above emetics are not at hand. Ipecacuanha and antimony are too slow in their action to be depended upon.

The contents of the stomach when ejected (or when obtained afterwards upon opening the body) should be carefully preserved for further investigation. This is often overlooked in the exciting period of treatment.

The writer has several times successfully pumped and washed out the stomachs of infants and very young children with a soft India-rubber male catheter, attached to the nozzle of an ordinary large glass or metal syringe.

The following formula may be employed as a *general antidote for any poison of unknown nature* :—

Calcined Magnesia
Powdered Wood Charcoal } *Equal quantities.*
Hydrous Peroxide of Iron

Half an ounce of each of these may be given in a tumblerful of water every half hour till three doses be taken.

Acids, Mineral—The stomach-pump should *not* be used. Alkalies—Lime, soap, chalk, potash, soda, or magnesia—moderately diluted with water, may be freely given. In the absence of these, plaster off a wall, oils (almond or olive) and small doses of morphine hypodermically should be administered; all food should be given by the rectum. At a later stage, when the danger of perforation has passed off, bland mucilaginous foods, like barley water, linseed tea, and whites of eggs, may be freely given.

Acid, Prussic (or Hydrocyanic)—The stomach, if possible, should be emptied by the stomach-pump or by a rapid emetic ($\frac{1}{2}$ dr. sulphate of zinc). Hypodermic injections of atropine (1-60th gr.); 2 minims of the 1 in 100 solution of atropine may be given, and repeated in 30 minutes if necessary. Ammonia or whiskey, inhalation of oxygen, ammonia, or chlorine, cold and hot affusions alternately, and *artificial respiration*, are the best agents to resort to.

Freshly precipitated oxide of iron, followed by a solution of carbonate of potassium, is to some extent a chemical antidote, but *free stimulation* after the evacuation of the stomach must be alone relied upon.

Aconite (and Hellebore or Veratrine)—The stomach-pump or emetics should be used; 1-10th gr. apomorphine hypodermically, or a table-spoonful of mustard in warm water, or $\frac{1}{2}$ to 1 dr. sulphate of zinc should be given as soon as possible. Stimulants—whiskey and ammonia hypodermically, with 20 to 30 minims of *tincture of digitalis* or 2 minims liquor atropinæ should be then administered. Strychnine may be given (1-30th gr.) by mouth, rectum, or hypodermically.

The patient should be kept horizontally on his back, and in a state of absolute rest, and sinapisms applied to the heart and extremities; and dry heat, friction, and artificial respiration kept up unceasingly. Murrell recommends inhalations of nitrite of amyl.

Alcohol—The stomach-pump should be promptly used, and the stomach filled through it with strong coffee, to which a little ammonia should be

added; or a hypodermic injection of 5 minims apomorphine solution may be given in the absence of the pump; sinapisms, cold affusion, nitrite of amyl inhalation, or electricity may be tried, and in *desperate* cases, boiling water may be used to cause immediate vesication of the skin over the soles of the feet. The hypodermic injection of 1-100th to 1-50th gr. strychnine is of unquestionable value, as pointed out by Gibson.

Ammonia and Alkalies—The stomach-pump should *not* be used. Weak acids (acetic preferable) may be given, largely diluted, and followed by draughts of almond or olive oil, or of melted butter, and demulcent drinks.

Tracheotomy may be required for the œdema of the glottis, and morphine hypodermically for the shock.

Antimony (Tartar Emetic)—Stomach-pump or emetics are not generally required, as vomiting sets in soon. Tannin, strong tea, or gallic acid, or any diluted astringent tincture or infusion containing tannin, may be freely given, followed up by the hypodermic or rectal administration of alcohol, to which small doses of digitalis or strychnine may be added. White of egg, barley water, or linseed tea may be given freely.

Butter of Antimony—The treatment of poisoning by this preparation of antimony should be the same as for the mineral acids—viz., magnesia, soap suds, chalk, potash, or soda, followed by oil and milk.

Arsenic—The stomach-pump or emetics, or 5 minims of apomorphine injection, should be employed even when vomiting has already taken place. Freshly-prepared moist peroxide of iron (prepared by adding soda or ammonia to the tincture of iron, and filtering rapidly through muslin or cambric) or dialysed iron in ounce doses, diluted, or, in the absence of these, magnesia freely, or animal charcoal, olive oil, or lime water, must be freely given; demulcent drinks and stimulants by mouth or rectum are also indicated. Large doses of castor oil are essential to clear out the intestinal tract and to prevent further absorption.

Atropine and Belladonna—The stomach-pump or emetics, and afterwards the following are to be given—Tannin, charcoal, or tea, morphine (1/2 grain) by subcutaneous injection, or laudanum by the mouth, or pilocarpine (1/3 grain) subcutaneously, followed by purgatives.

The poison being excreted by the kidneys, the bladder should be emptied by the catheter to prevent reabsorption. Eserine in small doses has been advocated as an antagonist, but pilocarpine is better. Free stimulation, counter-irritation, and artificial respiration may be necessary.

Cannabis Indica—The stomach-pump or emetics, especially apomorphine hypodermically (5 minims of B.P. injection), are to be given, and the symptoms treated as they present themselves. It will generally be found necessary to both purge and stimulate.

Camphor—The stomach-pump or emetics, and copious draughts of water, with brisk saline cathartics, and general counter-irritation, or cold and hot douches alternately, afford the best means of dealing with this poison.

Cantharides—Stomach-pump or emetics, mucilaginous drinks, or in their absence, oils, chalk, a little opium by the mouth, and a morphine suppository by the rectum, should be used.

Carbolic Acid—The stomach-pump with its soft rubber tube should be used, after which the organ should be thoroughly washed out with pure glycerin or with solution of Epsom or Glauber's salt. Give oils, egg albumen, and warm mucilaginous drinks, with any soluble sulphate, and finally, freely stimulate, counter-irritate, and inject 1-60th grain of atropine. Though there is no known antidote, the writer—in a case where half a cupful of the strong acid was taken in a fit of drunkenness—after the contents of the stomach were evacuated, washed that organ out repeatedly with pure glycerin, using half a

gallon of it, the glycerin dissolving the excess of acid out of the swollen mucous membrane, and the patient made a good recovery. He has since satisfied himself that this is the best treatment whenever the strong acid has been swallowed. Alcohol has been recommended as an antidote, but its value has yet to be proved.

Chloral Hydrate—The stomach-pump or emetics, especially 5 minim injections of apomorphine solution should be used, and these must be followed by injections of strychnine (1-20th grain), or of atropine (1-25th grain), caffeine (5 grains) or free stimulation with ammonia, whiskey, or ether, and sinapisms, *particularly external warmth*, electricity, and artificial respiration; inhalation of amyl nitrite may be tried. The patient should be roused and prevented from sleeping, and, as death may occur from the diminution of the body heat, warmth is essential. A pint of strong, warm coffee into the rectum, as advised by Murrell, may save life.

Chlorine, when inhaled, must be treated by inhalations of ammonia or sulphuretted hydrogen. If the poison has been swallowed it should be neutralised by large quantities of albumen and mucilaginous drinks.

Chloroform—When symptoms of an alarming interference with the breathing or circulation come on during anæsthesia, the tongue should be drawn forward, artificial respiration, cold affusion, free ventilation by a current of air, turning over the patient upon his left side, or inversion of the body, may be tried.

Hypodermically—whiskey, ammonia, strychnine, or digitalis, or inhalation of nitrite of amyl, may be given. Galvanism is doubtful. If the chloroform has been swallowed, use the pump, or give 5 minims of apomorphine solution, and proceed as if inhaled.

Colchicum—Stomach-pump or emetics, mucilaginous drinks, albumen, or strong tea or tannin, should be given, and these should be followed by a purgative, after which free stimulation may be required, and symptoms met as they arise.

Conium—The stomach-pump or emetics, tannin, and castor oil should be used. Stimulate freely by ammonia. Hypodermics of strychnine or atropine may be tried, and artificial respiration persevered with.

Copper Salts—The stomach-pump or emetics must be resorted to if free vomiting has not occurred; yellow prussiate of potassium, egg albumen or milk, which form insoluble copper salts, are to be given; mucilaginous drinks, and wheaten flour or water in which yolks of eggs are suspended, and the free use of opium to allay irritation, are called for.

Corrosive Sublimate. (See Mercury.)

Creosote—The same treatment may be employed as in poisoning by carbolic acid.

Croton Oil—The general treatment for irritant poisons may be used, viz., emetics, or, if in the early stage, the gentle use of the stomach-pump, demulcent drinks, soothing enemata, and opium. Free stimulation and counter-irritation may be necessary.

Cyanide of Potassium poisoning is to be treated as if hydrocyanic acid had been swallowed, and if seen at once give solution of ferri sulph., and alternate hot and cold douche, whilst atropine is given by hypodermic injection.

Digitalis—The stomach-pump or emetics, especially sulphate of zinc ½ drachm, or 5 minims of apomorphine solution hypodermically, tannin, or animal charcoal, free stimulation and the hypodermic injection of 1-120th gr. aconitine, and the free use of opium are required. Muscarin (⅓ gr.) is antagonistic, and alcohol should be given.

The patient should be kept absolutely quiet, and in the horizontal position.

Elaterium—Emetics or the stomach-pump must be used. Demulcent drinks and opium are to be administered freely, and the general treatment of the symptoms of gastro-intestinal irritation is to be followed.

Eserine, or Calabar Bean—Emetics or the pump, with tannin or any tannin containing liquid, may be employed, but hypodermic injections of atropine (1-30th gr.) till the pupils widely dilate, afford the best chance. Strychnine and chloral have been recommended.

Artificial respiration should be assiduously tried, with friction and warmth externally.

Ether (Inhalation)—Pull forward the tongue, give free current of air, commence artificial respiration, and treat as if chloroform poisoning.

Fungi, or Muscarin—Emetics or the pump should be used, and atropine given hypodermically (1-60th gr.) and repeated till the pupils dilate, or digitalis or morphine may be given. Free stimulation, sinapisms, and friction may be required.

The writer has had to treat a large school of children who had eaten fungi. Many of them were very bad, and about six appeared to be dying when first seen. Atropine appeared to act like magic, and all made a good recovery.

Gelsemium—The stomach-pump and emetics are to be used, and bicarbonate of potassium and tannin freely given; warmth, free stimulation with alcohol, electricity, and artificial respiration are to be kept up.

Hypodermics of ammonia or atropine, or digitalis, are partially antagonistic. The best result will follow 3 minims of atropine solution.

Hydrocyanic Acid (Prussic Acid)—Antidote and treatment are described under Acid. Prussic.

Hyoscyamus. (Same as for Atropine.)

Iodine—Emetics or the *cautious* use of the rubber tube of the stomach-pump should be employed, together with the free administration of starch, arrowroot, bread, boiled potatoes, flour, lime water, and demulcent drinks.

Laburnum—The stomach-pump, if possible, should be always used, even if vomiting has occurred, as portions of seeds, &c., may remain in the stomach. Free stimulation, and, in bad cases, hypodermic injection of ammonia. Counter-irritation, friction, and the cold douche are necessary.

Lead Salts—The stomach-pump, or, perferably, a large emetic of sulphate of zinc, which is also an antidote, should be given, and followed by milk, white of egg, diluted sulphuric acid, Epsom or Glauber's salts, or phosphate of sodium, sulphuretted hydrogen, or Harrogate water. Demulcent drinks, with mild opiates to allay pain and spasm, may be administered. (See also under Plumbum.)

Lime—Carbonic acid—any aerated water, as soda water or lemonade—is very useful; or weak acetic acid or vinegar, freely diluted, and followed by oil or demulcent drinks, may be swallowed.

Lobelia (or Tobacco)—Emetics or the pump should be employed, as should also tannin, and free stimulation externally by sinapisms, friction, and dry heat, internally or hypodermically by alcohol, ammonia, and ether, with strychnine (1-30th gr.), and small doses of opium. The patient must be kept strictly in the horizontal position.

Mercury (Corrosive Sublimate)—Emetics, or the very cautious use of the pump will be required. (The pump should not be used except in the very early stages of the poisoning.) Albumen or gluten (prepared by washing flour in a muslin bag), demulcent drinks, milk, and oil are to be given by the mouth, and morphine and alcohol subcutaneously.

Morphine. (See Opium.)

Muscarin (or Mushrooms)—Same treatment as in poisoning by Fungi—viz., the subcutaneous administration of atropine after the use of an emetic or the pump.

Nux Vomica. (See Strychnine.)

Opium (or Morphine)—If seen immediately 1 grain of permanganate of potassium may be given in water, and if the drug is in the stomach it will instantly decompose it. The stomach-pump, or, in its absence, emetics (if capable of swallowing) must be resorted to, or 1-10th to 1-5th grain of apomorphine injected hypodermically. The stomach should be washed out with tepid water, and filled with strong coffee, or tea, or any infusion or liquid containing tannin. In all severe cases the stomach should be washed out at intervals during the treatment, as the drug is excreted by the gastric mucous membrane.

Caffeine, atropine, or strychnine, hypodermically, is to be administered. This latter should be repeated frequently as long as there are dangerous cardiac or respiratory symptoms; 1-75th grain may be given every 2 or 3 hours. Flagellations, cold and hot affusions alternately, electricity, extensive sinapisms, or very hot water, to cause vesication in desperate cases, must be employed to rouse the patient, and when once aroused he should never be allowed to fall asleep again, but should be kept continually on the move, though every care must be exercised lest this should be carried too far so as to induce exhaustion, as is, unfortunately, often done Artificial respiration may be required.

Nitric Acid. (See under Acids, Mineral.)

Oxalic Acid—The pump or emetics must be used. Lime (lime water, putty of lime, or chalk) is the best antidote; one good dose of castor oil, counter-irritation, free stimulation, and the treatment for gastro-enteric inflammation should be followed.

Pilocarpine—The stomach-pump or emetics will be required, together with the free administration of tannin and the hypodermic use of its antagonist—atropine—in 1-40th to 1-20th grain doses.

Phosphorus—The pump or emetics will be necessary. Sulphate of copper 5 grains every 15 minutes, is both antidote and emetic. French oil of turpentine or any old oil of turpentine, purgatives, and demulcent drinks containing magnesia and albumen should be swallowed. Oils and butter should be avoided.

Physostigma. (See under Eserine.)

Potash (Caustic)—Emetics must be administered. The pump should *not* be used. Weak acids (vegetable preferred, and largely diluted), oils, and butter may be freely administered. The after treatment will consist in rectal feeding, and after the danger of perforation has passed away, the free use of barley water, linseed tea, and other demulcents.

Potassium Chlorate—The pump or emetics and profuse demulcent drinks and purgatives are indicated, along with hot blanket baths and the treatment for acute Bright's disease.

Silver Nitrate—(or Lunar Caustic)—Large doses of common salt or sea water should be swallowed. Emetics and the pump (India-rubber tube) should be used, and white of egg into the stomach after the poison is removed. Yolk of egg, wheaten flour, or milk mixed with water should be freely administered.

Soda (Caustic)—Acids and oils will be required (as for Potash).

Stramonium—Emetics, tannin, free stimulation, and hypodermic use of morphine are the necessary treatment (same as for atropine and belladonna).

Strychnine—The pump or emetics, especially a hypodermic injection of 1-10th to 1-5th grain apomorphine, must be given, followed by charcoal or tannin in large quantities. Tobacco by rectum (with great caution—not more than 20 grains at once), bromide of potassium in large doses (2 drs. to 2 ozs.), chloral, chloroform, Calabar bean, conium, morphine, ether, &c., are recommended. The writer believes that poisonous doses of *alcohol* afford the best treatment, given both by mouth and rectum. Artificial respiration may be tried. Chloroform inhalation may be kept up as long as the convulsions are severe.

Sugar of Lead—Sulphate of zinc, albumen, &c. (See Lead.)

Sulphurets and Sulphuretted Hydrogen—Inhalation of air containing a small percentage of chlorine in it, and the free administration of a very weak solution of chlorinated lime or soda, constitute the necessary treatment.

Sulphuric Acid. (See under Acids, Mineral.)

Tartar Emetic—Tannin, green tea, &c. (See Antimony.)

Tobacco—Emetics, tannin, free stimulation, and hypodermic injection of strychnine (1-20th grain) are indicated, and the recumbent position must be strictly maintained (as for Lobelia).

Veratrine—The pump or emetics must be used, followed by alcohol, opium, &c., as for Aconite (which see).

Zinc Salts (chiefly the Chloride, as Burnett's Fluid)—The rubber tube of the stomach-pump should be used with caution, or emetics, especially apomorphine, 1-10th grain, may be injected hypodermically. Egg albumen, tea, tannin, milk, alkalies or their carbonates, demulcent drinks, and soothing enemata containing a little laudanum, are to be administered.

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OR

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